a consequence of neglect by farmers who could not return to their fields. Of the 60,000 rainfed areas, half require rehabilitation of up to 20 per cent.

283. The mission was further informed that at the present time 30 per cent of the agricultural land had been rehabilitated, 20 per cent was under rehabilitation and 50 per cent still remains untouched.

284. It was reported that, of the 430 pumping units in the area, 349 units had been put out of service, looted, deliberately destroyed or massively cannibalized for parts. The present situation is that 160 units have been repaired, 40 units have been newly installed with the remaining 149 units completely destroyed or looted.

285. It was reported that the damage to the canal network followed the same pattern as the land degradation. Massive total destruction (100 per cent) of small- to medium-size canals, totalling about 135 kilometres, has occurred. These canals will require a complete overhaul. One of the few large canals, with a water flow-rate of between 20 and 50 cubic metres per second, has been over 50 per cent destroyed and will have to be reshaped as well as dredged.

286. Much farm machinery was lost, thereby reducing available horsepower at the farm level from 0.7 to 0.5 HP per hectare. Most of this loss is reported to be by looting and the deliberate destruction of machines. However, it was reported that a considerable amount of machinery was also removed by farmers, wherever they could, when evacuating the war-stricken farm areas.

Khorramshahr - Abadan (Minu) region

287. Before the outbreak of hostilities, agriculture in the region was highly prosperous with abundant support facilities, transport terminal storage and processing facilities. The area was known as the centre of date production and export, with the plantation on Minu Island alone accounting for over 1 million date palms out of a total of 7 million trees under production in Khuzestan.

288. It was reported that the total cropped area amounted to over 35,000 hectares and was cultivated with wheat, barley and vegetables, apart from date palms. The cultivated area was entirely irrigated either by means of direct pumping from rivers and waterways to the field via an intensive water distribution network or by river diversion making use of tidal movements. On-farm irrigation techniques were simple, small border furrows or basins for trees. The water feeding system was complex and in certain cases has been used for centuries. Except for the main canal, most of the irrigation canals were earthen and unlined.

289. It was also reported that over 550 pumping stations were in service, delivering irrigation water to some 300 kilometres of main and 1,100 kilometres of secondary and tertiary canals. The overall power available for mechanization fluctuated between 0.5 HP for tree plantations and 0.7 HP for field crops.

290. The mission was informed that approximately 14,600 hectares of cultivated land were totally destroyed in Khorramshahr and Abadan alone. This was a consequence of (a) heavy fighting, (b) occupation by armed forces for considerable periods of time, (c) the construction of barracks and other military facilities, (d) dense soil compaction as a result of movements of heavy equipment and (e) construction of embankments and other soil-disturbing activities.

291. In addition cultivation was impossible during the war and the land has lost its fertility and has become biologically sterile. It was reported that over 5,000 hectares had been subjected to salinity and waterlogging problems either because of direct flooding with brackish water or because of the increased level of the water-table.

292. It is the view of the mission that these problems are likely to have been caused by the modification of the water flow regime as a result of blockage by military debris in the downstream sections of the waterways and the consequent high rate of sedimentation. Remedying this situation will require the dredging of outlets and the main waterways. All involves major work that could be extremely costly and time-consuming. Furthermore, as groundwater movements are often a slow process, salinization and waterlogging problems are becoming increasingly apparent and may continue to be so.

293. The date plantations have suffered an enormous setback that will be felt for the next 10 to 15 years. It was reported that of the 7 million trees that were under production in Khuzestan, over 3.05 million mature plants have been destroyed in Khorramshahr, Abadan and Shalamcheh, representing a loss of 155,000 tons of dates per year of production. Considering that, on average, a reported Rls 50,000 are required to plant a new tree and nurse it until it reaches maturity, it is clear that massive amounts of investment will be needed. Even for those plantations that had not been affected, lack of maintenance and care by owners forced to leave their land has caused nature to take over thereby requiring massive operations to clear the wild vegetation.

294. Approximately 515 pumping stations were reported to be out of service but, because of the presence of mines, a detailed inventory of the condition of the units had not been carried out at the time of the mission.

295. It was reported that water distribution systems for irrigation had been heavily damaged and are at present practically non-existent. The network of canals and related small hydraulic structures have been completely put out of operation by military activities such as vehicles, cross-country movements of equipment or siltation from silt-laden rivers. Wind and water erosion from adjacent land have also contributed to the filling of the canals with silt. The inevitable lack of maintenance during more than eight years has been conducive to prolific vegetation taking root. Official statistics indicate that 1,020 kilometres of main canals are moderately damaged and another 880 kilometres lightly damaged. It was reported that some of the above canals were reconstructed several times, and that approximately 550 kilometres of the secondary and tertiary canal system were totally destroyed.

296. The power available at the farm level is estimated to have dropped below 0.5 HP. It was reported that most machines and pieces of equipment were looted or destroyed or taken away by the owner whenever possible.

Ahwaz-Dezful region

297. Before the war the Government had initiated a programme for the establishment of seven agro-industrial companies in the region for the production of sugar and by-products. Each undertaking was to cover some 12,000 hectares of irrigated sugar cane. Because of the war it was reported that only two schemes in the Dezful area were constructed and became operational, with a gross area under cultivation of 33,000 hectares. One of these schemes is the Hafttappeh Cane Sugar Company around Shush with 11,000 hectares of irrigated cane and a nominal milling capacity of 100,000 tons of crystalline sugar per year. The other scheme is the Karun Agro-Industrial Company, which was the biggest in the country with a capacity of 250,000 tons per year. Today production levels reportedly stand at 80,000 tons and 50,000 tons respectively. This loss in production is attributable to damage inflicted on the plant by air attacks. It was reported that 40 per cent of the machinery was completely destroyed.

Observed damage in Khuzestan Province

298. Because of the extent of the area involved, the time that has elapsed since the damage occurred, and the repair and reconstruction work that has since taken place, it is difficult to quantify with any great precision the magnitude of the damage in much of the province. There has been some rehabilitation in the Azadagan and Khorramshahr-Abadan regions, however, and it provides a good idea of the overall scale of destruction.

299. The mission inspected several irrigation and rainfed schemes in these areas. At the Yazd Non scheme, comprising 20,000 hectares in the Azadagan region, the mission found that 20 garden farms of about 7 hectares each had been completely levelled. The pumping station had been completely destroyed with the debris of the engine still evident and only the foundations of the storage facilities and houses were still visible. The land itself was bare with no signs of life, but many traces of furrows were still visible.

300. Between Yazd Non and Hamidiyeh, long stretches of mined areas were observed. The topography had been severely disturbed and high embankments and revetments were everywhere. Some remains of settlements surrounded by debris of various pieces of military equipment were visible. The land is bare and has become sterile with only a few bushes visible.

301. In the area between Ahwaz and Hamidiyeh two different situations were observed. Travelling from Ahwaz, the land to the west of the main road has been cleared since the war and 15,000 hectares are now under rainfed agriculture. Wheat and barley had been grown, representing the first crops since the beginning of the war. The yields were low however because of partially degraded soil conditions causing poor germination of seeds

(estimated at only 15 to 20 per cent of the sown area), which in turn led to low crop coverage. In contrast, on the east side of the road the irrigation canals were completely abandoned and destroyed. Mines, trenches, debris and a ravaged topography were observed, making it inaccessible for farm equipment and implements and making irrigation virtually impossible.

302. Between Ahwaz and Abadan a number of pumping stations were visited. Most of the pumps had disappeared or had been destroyed and no signs of surrounding canals were visible.

303. At the Minu palm plantation, some 75 per cent of the palm trees have been burnt or are dead. The area has been invaded by reeds and bushes which need be cleared. Salinity and waterlogging problems were observed in several locations as a result of rising groundwater and surfacewater flooding. Such problems have been caused by downstream obstructions of the waterway by military equipment, sunken boats, etc.

304. Vast areas of destruction in the province were also observed and confirmed by means of helicopter fly-overs.

(b) Ilam Province

305. Most of the devastation in Ilam occurred in the border areas with Iraq along a strip some 25 kilometres wide, stretching from Dehloran to Mehran.

306. It was reported that the cropped area in the region of Dehloran and Mehran before the war amounted to 23,000 hectares of irrigated land, 56,000 hectares of rained agriculture, 700,000 hectares of pasture land and 100,000 hectares of mixed pasture (including bushes and trees). Crops grown included wheat (irrigated), barley (rainfed), alfalfa, maize, citrus, dates and vegetables.

307. Surfacewater resources available for irrigation purposes amounted to a reported 800 million cubic metres per year. Various diversion dams had been constructed with regulated water flows varying from 1.2 to 5 cubic metres per second. The groundwater resources were exploited where the area could not be controlled by diversion structures; about 150 deep wells were installed with discharges between 40 and 70 litres per second. Normally, irrigation was practised by surface method; however some sprinkler and drip systems have been used on alfalfa and on orchards.

Reported damage

308. It was reported that over 50 per cent of the 23,000 hectares of irrigated land had suffered heavy damage and 50 per cent of the 56,000 hectares of rainfed agriculture had suffered moderate damage from both military campaigns and occupation. About one third of the 150 equipped deep-water wells, has been completely destroyed either by deliberate blasting or by looting. The remainder suffered moderate damage. Half of the shallow wells or river pumping were reported looted and the rest dismantled or destroyed.

309. The mission was also informed that 50 kilometres of drainage facilities, canal and minor structures had been completely destroyed and that 95 kilometres of main, secondary and tertiary irrigation canals had suffered heavy damage requiring reshaping, dredging and lining. The irrigated areas under sprinkler and drip-irrigation systems, including the control systems, have been reportedly completely devastated, burned and/or looted. A number of small- and medium-sized dams were hit and washed away at Dovirg, Conjacham and Mehran Bard, depriving the land of a water flow of 13.2 cubic metres per second. In view of the scope of the damage and the fact that most of the rural population had not returned, it was reported that the original power available at the farm level of 0.7 HP per hectare had now dropped to almost zero. Only the agro-industrial company had acquired some farm equipment.

Observed damage

310. The area around Dehloran and Mehran was visited by the mission. It was observed that the area had suffered widespread destruction and little could be seen of the original infrastructure.

311. The mission visited three sites. Near Dehloran, the Doving Diversion Dam, an earth/gabion structure, was reportedly first hit in 1983 during an air raid on the road bridge downstream, causing large parts to be washed away. Reconstruction started the same year but work was abandoned after further attacks on the project. The dam has now been replaced by a cement structure with offtakes on either side. The structure is 132 metres long and 6 metres high, with a yearly capacity of 200 million cubic metres and a discharge of 2.5 cubic metres per second through two offtakes supplying two 20-kilometre canals each one serving 2,500 hectares. In 1988 the first 5 kilometres of each canal were lined. Although the headworks are operational, the intake on the right side is still under construction, while work has yet to start on the dam's left-side intake and canal. The mission did not have the time to analyse the technical aspects in detail but the original earth/gabion foundations have been maintained and caving problems may occur in the future. Canals downstream are currently not carrying irrigation water nor do they have culverts.

312. Near Mehran the agro-industrial complex consisted of a 2,000 hectare unit with land irrigated through surface and pressurized systems. The processing unit was never constructed as a consequence of the war. More than 80 per cent of the infrastructure has been destroyed; the pumping-station borehole and control unit for the sprinkler and drip-irrigation systems have been completely destroyed and field ditches and secondary canals will need to be completely reconstructed. The storage and ancillary buildings have been damaged but can be rehabilitated. The equipment and accessories for the pressurized irrigation system have been either burned or looted, the mechanized farm implements have been dismantled, looted or blasted and approximately 10 hectares of orchards have disappeared. On an overall basis not more than 10 per cent of the complex can be recuperated.

313. Conjacham Dam and its operational centres suffered major damage. Apart from the diversion tunnel the whole dam has had to be reconstructed. At the time of the mission's visit, the dam, which is 3 metres high and 200 metres in length, had been permanently rebuilt with a capacity of 150 million cubic metres per year and a diversion discharge of 5 cubic metres per second. Despite this reconstruction, the mission observed that few farmers had returned to their fields. In agricultural areas in Ilam not yet rehabilitated, a scene of devastation prevails, similar to that in Khuzestan Province.

(c) Bakhtaran

314. The survey and field visits were concentrated in the areas of major damage, Sumar, Naftshahr, Guilan-e-Gharb, Sar-e-Pol-Zahab and Qasr-e-Shirin. Information was also obtained from areas surrounding the townships of Paveh-Javanrud and Eslam-Abad. The total area under crops in the above regions amounts to 340,400 hectares with 255,600 hectares of them irrigated.

315. Parts of the northern and western zones fall within the watersheds of the Sirvan and Alvond rivers, making water resources abundant. Considerable groundwater resources underlie most of the major plains and the majority of aquifers are of medium depth, allowing for low cost extraction. The soil is generally good and the main crops grown in the area are irrigated and rainfed wheat, cotton, corn and vegetables. Orchards play an important role in the economy of the region and some have benefited from modern irrigation technologies.

Reported damage

316. Over 30,000 hectares of land have reportedly been totally damaged and will require intensive levelling. A further 26,500 hectares will require moderate to major rehabilitation. In addition the orchard plantations, including walnuts, citrus and pomegranate, have reportedly suffered complete destruction: 4,730 hectares have been uprooted, burnt or suffer from lack of proper maintenance and water. The whole irrigation network and basins system will need to be reconstructed.

317. A full inventory of the damaged pumping stations was not available as the surrounding land is still heavily mined. However, it is estimated that 32 complete units will need to be replaced.

318. In Qasr-e-Shirin and Kosray, 48,000 square metres of agricultural support buildings with material and equipment have been reportedly completely destroyed. These include the agricultural quarantine unit in Kosray, the agricultural extension service facilities, plant protection building, cooperative storage facilities and the agricultural research centre in Qasr-e-Shirin.

319. It was reported that the overall surface network water distribution system - surface and pressurized and drainage facilities - as well as the on-farm and distribution systems, had been completely destroyed with a loss of 30 metres per hectare or a total of 1,000 kilometres.

Observed damage

320. It was not possible for the mission to make ground field visits in the most damaged areas as farm land surrounding the areas of Qasr-e-Shirin, Sar-e-Pol-Zahab and Guilan-e-Gharb is still mined. An aerial overview however gave an approximate idea of the scale of the damage to land and buildings. The agricultural buildings have been completely flattened; severe land damage, similar in nature to the other provinces, has occurred in most of the area around Qasr-e-Shirin, becoming light to moderate around Guilan-e-Gharb. It was not possible to assess the damage to canals but a global estimate of 30 to 50 metres per hectare seems reasonable considering the traditional nature of the irrigation practised in the region.

321. Overflying citrus and date plantations provided a sad picture of bare land with a few remaining trees or burned trunks.

3. Forests and pastures

322. The following information was obtained from the Ministry of the Jihad but was not assessed in the field.

(a) Forestry

323. The total acreage of forests in the five provinces bordering Iraq amounts to 1.75 million hectares with West Azarbayjan accounting for 200,000 hectares, Kordestan 300,000 hectares, Bakhtaran 650,000 hectares, Ilam 300,000 hectares and Khuzestan 100,000 hectares.

324. Since the beginning of the war, 85,200 hectares of natural forest have been destroyed for military reasons such as access roads, visibility, etc. Thus, considering an average yield of 90 cubic metres of wood per hectare of forest, this corresponds to a loss of some 7.7 million cubic metres of wood. An area of 46,550 hectares of cultivated forest had been exploited by the army for various reasons, for example, charcoal, carpentry, etc. At a yield of 15 cubic metres per hectare (young trees), a loss of 698,250 cubic metres of wood was incurred.

325. The mission noted that, while the above figures appear large, the indirect effects of such deforestation on the environment, such as soil conservation and degradation aspects, erosion and sedimentation of dams and other hydraulic structures, could be 15 times higher than the direct losses.

(b) Pastures

326. Almost 753,000 hectares of pasture land in the war zone have been lost as a result of military structural requirements such as roads, barracks, storage facilities, etc. Furthermore, herds moving into neighbouring provinces have caused overgrazing, which has caused damage of an extent that has yet to be assessed.

4. Fisheries

327. Khuzestan is the only province where fisheries have been affected by the war. The damage was mostly concentrated in the Arwand Kenar township, whose population consists mainly of fisherman. The average yearly catch for traditional wooden vessels is 50 to 60 tons of edible fish and 300 tons for steel ships.

328. The losses of boats during the war amounted to 200 wooden vessels of about 20 to 80 gross registered tons and 50 steel fishing vessels of 300 gross registered tons.

329. The mission was informed that the war had also damaged a considerable number of cold storage facilities.

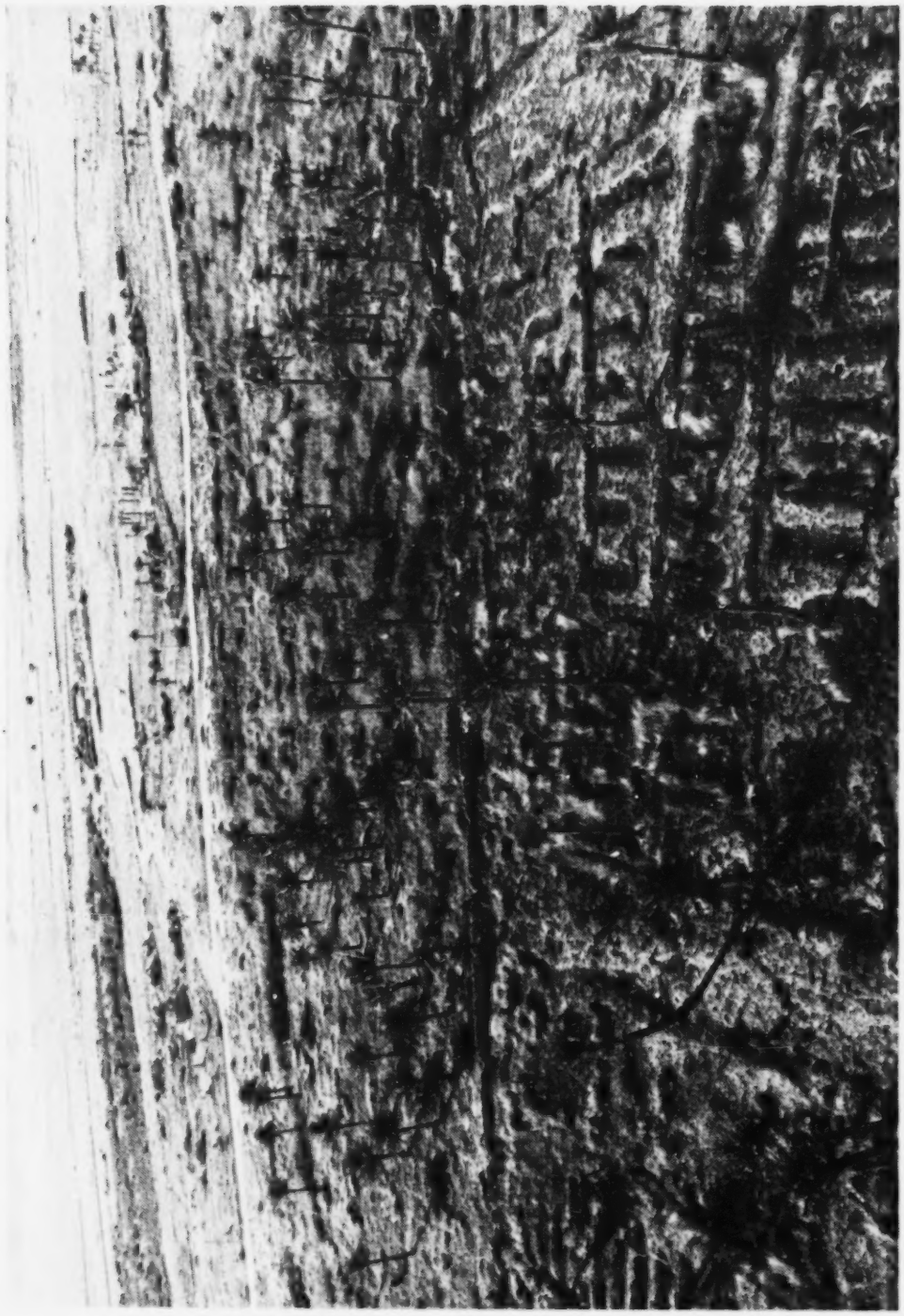
5. General observations

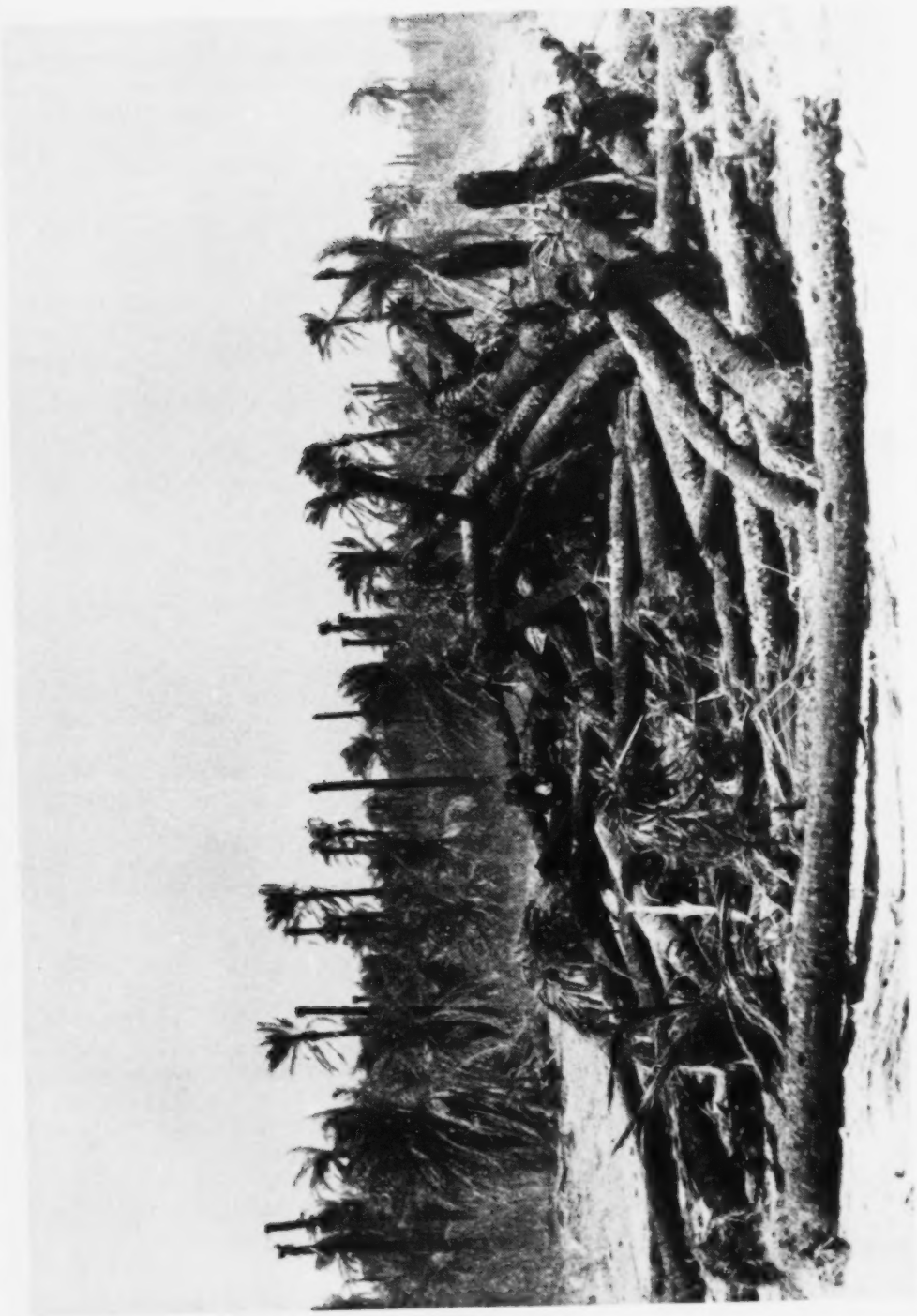
330. In the five provinces bordering Iraq, the agricultural sector has not only been largely destroyed but has suffered a serious setback in terms of modernization. A massive effort on the part of the authorities and rural population will be required to reclaim the land and to restore the standard of the agricultural industry to at least its former level.

331. The soils of the plains have suffered severe stress from the war, embankments, compaction and destruction of organic components and their fertility is in danger. Given the arid nature of the land an irreversible situation may well be ahead if no appropriate remedial measures are taken soon.

332. River flow regimes, particularly in the delta region, have been disturbed, creating such phenomena as salinization and waterlogging. Unpredictable long-term modification of groundwater behaviour may well occur. The traditional irrigation system based on tidal movements could force major problems, and strict monitoring is essential as part of the measures to control further degradation of the natural resources.

333. Rehabilitation of physical infrastructure such as headworks and water distribution systems are already being vigorously pursued wherever possible but few developments are to be seen downstream from these activities. Farmers do not seem to be prepared to return to their fields for various reasons. This situation requires urgent attention as continued postponement of farming practices will further encourage soil degradation.





D. Industrial, manufacturing and mining activities

334. It is the Government's policy to strengthen and expand the activities of the industrial/mining sector as part of its economic diversification policy. For this reason special measures have been taken to create and develop suitable industries that can utilize domestically available materials, machinery and technologies. Moreover, a policy has been laid down on strengthening and developing productive capacities as well as the competitiveness of small industries. The industry/mining sector employs at present about 13 per cent of the national labour force.

335. Based on the Government's final report on estimates of damage arising from the war, "industry" comprises the following activities whether they are carried out by hand or with the help of a machine, in a factory or at home:

(a) Food industry;

(b) Weaving, handicrafts, rural crafts and leatherwork;

(c) Cellulose and paper industry;

(d) Chemical and petrochemical industry;

(e) Non-metallic mineral industry;

(f) Metal and smelting industry;

(g) Mechanical industry;

(h) Electronics industry;

(i) Vehicle industry.

Data relating to the refining of petroleum products have been included with the oil sector rather than under the industry sector.

Direct damage

336. The Government estimates that direct losses to the industry sector during the war years amounted to Rls 1,626,859 million, accounting for 5.3 per cent of the total damage to economic activity over all (Rls 30,811,423 million).

337. A breakdown of direct damage to industrial activities during the war is as follows:

	Percentage	Millions of rials
Buildings and installations	9.5	154 597
Machinery and equipment	88.63	1 441 900
Materials and goods	1.87	25 572

338. The following tables show government agencies that have reported damage to industry, together with the estimate of damage expressed in percentage and monetary terms.

Agency	Percentage	Millions of rials
Ministry of Industry	67.74	1 102 029
National Iranian Oil Company	30.361	495 563
Ministry of Defence	0.749	12 181
Ministry of Construction Jihad	0.566	9 207
Pars Vagon Co.	0.205	3 342
Foundation for the Deprived	0.169	2 752
Ministry of Agriculture	0.056	916
Iran Tobacco Corporation	0.051	831
Iran Wood and Paper Industries Co.	0.002	38

Indirect damage

339. According to government estimates, indirect damage to industrial activities amounted to Rls 851.8 billion.

340. Government agencies that have reported indirect damage to industrial activities are as follows:

Agency	Percentage	Millions of rials
National Iranian Oil Co.	79.7	677 088
Foundation for the Deprived	10.3	87 137
Ministry of Industry	8.7	73 943
National Petrochemical Corporation	1.1	9 762
Iran Tobacco Corporation	0.3	2 702
Pars Vagon Co.	0.07	587
Ministry of Commerce	0.05	461
Iran Wood and Paper Industries Co.	0.02	180

Map 6

MAP NO. 3642.7 UNITED NATIONS
JULY 1991

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1. Observed level of damage

341. Since the country's major oilfields are located in the western border region, they stimulated the growth of a large number of light and heavy industries located principally in and around the ports of Khorramshahr, Abadan and Emam Khomeyni. During the war these industries suffered considerable losses.

342. All three ports, together with the industrial and service units that support them, were subjected to heavy and repeated attacks from land, sea and air throughout the conflict, causing widespread destruction. In other parts of the border provinces, particularly in militarily contested areas where the land forces of the two sides conducted long-drawn-out campaigns, the devastation was on a similar scale. Industrial centres located away from the border region were also attacked by aircraft and missiles, although on a lesser scale.

343. The Ministry of Industry presented the mission with a list of 779 companies that had sustained damage as a result of the conflict. The damage by province is as follows:

Khuzestan	475
Bakhtaran	94
Ilam	150
Kordistan	33
Azarbayjan	27
Total	779

Based on the information provided by the authorities, arrangements were made for the mission to visit a number of factories, which represented a cross-section of the industrial sector to inspect the damage on site.

344. In the course of site visits a standard damage report form was given to the manager of the installation to complete. This form solicited information on the type of industry, a description of the installation, major products, production capacity and number of employees. It also requested information on the number and types of enemy attacks and the total period the facility had been out of operation as a result of damage sustained. Observations by the mission were also recorded on these forms. The survey forms are part of the mission files. The following is a summary of the contents of these forms.

345. In Khuzestan Province the mission visited 27 industrial/manufacturing companies ranging from small units with 25 employees or less to much larger units employing between 2,000 and 6,000 persons. The results showed that 20 of them were not in operation either because their units had been heavily destroyed and were beyond repair or because reconstruction work had still to be completed.

346. Four other units, all of which are major industrial enterprises, were actually in operation but their output was well below production capacity. These included the large paper mill at Haft Tappeh, the Dezful sugar refinery and the Kavian and ASCO-Ahwaz steel complexes in Ahwaz. All sites visited showed clear signs of having been damaged either by aerial bombardment or by artillery fire or by both.

Dezful sugar refinery

347. In the sugar refinery heavy damage had been inflicted on buildings, equipment, the power plant, the overhead crane and the conveyer system. The warehouse was reported to have been stacked with 7,300 tons of sugar at the time it was destroyed. Reconstruction work has begun and the plant, which has a nominal capacity of 5,000 tons a day, has now reached a level of 75 per cent of its output.

ASCO-Ahwaz steel complex

348. The complex, which employs 6,000 persons, was repeatedly shelled during the war. Although it was commissioned to begin operation in mid-1986, it never began operation until the cease-fire. The complex has an output capacity of 1.5 million tons a year. At present it is operating at approximately 50 per cent of that capacity. Emergency repairs and reconstruction work were effected after each attack in order to keep the plant operable. This often involved a considerable degree of improvization because of the difficulty in procuring the original parts from the overseas suppliers.

Pars paper company

349. This company employs a staff of 2,700 working in three shifts. It was said to have been attacked repeatedly in 1986 and 1987 with considerable damage to buildings, structures and equipment. The tissue factory has yet to be reconstructed. The production capacity of the plant was 105,000 tons per year, but at present it is producing only 71,000 tons. Reconstruction work continues and it is expected that the plant will reach full production by 1992.

350. The mission visited 10 industrial units in the province of Bakhtaran. Six of these are still out of production as a result of heavy damage inflicted on their plants. They include:

(a) The Khane Suzi prefabricated concrete plant, which suffered vast damage by air raids. Reconstruction work has begun but the plant's present output is only 25 per cent of its production capacity of 35,000 tons per year. The mission observed that heavy damage had been sustained by its structures, equipment and the conveyor system. Two production lines were heavily damaged but one has since been reconstructed;

(b) The Eslam-Abad sugar refinery, which had a production capacity of 1,570 tons daily, has been excessively damaged. The entire area in which the sugar refinery was located was devastated. Apart from the plant itself, 80 residential units were destroyed. Reconstruction is still under way and it is expected that production can be resumed within the next 6 to 12 months;

(c) The Garb cement company, which was heavily damaged during the conflict. Construction work is well advanced and at the time of the visit the plant had an output of 1,000 tons a day, or two thirds of its production capacity. The mission observed that damage had been done to the control rooms, the power stations, the conveyor system and the raw material mill and the transformer station.

351. The mission also visited a number of industrial units that had been partially damaged and where production had almost returned to normal. Among these units was the West textile company. Here the mission was informed that the plant had been attacked in 1986 and that the damage sustained caused operations to be suspended for a year. Considerable reconstruction work has taken place and the output of the plant has now reached full production capacity. Although most of the damage has been repaired, the mission was able to observe evidence of repair work to the roof of the production section as well as the equipment therein and signs of repair and reconstruction work in the boiler room and the raw material warehouse.

352. The sites of about 40 small tile-making units in Qasr-e-Shirin were inspected by the mission and found to be completely flattened. It appeared that they had been demolished by explosive devices. The mission was taken to a nearby locality and shown two new units under construction.

353. The third province visited by the mission was Markazi, where a major industrial park has been established in Arak. Here the mission visited five industrial units, the largest being the Iralco-Iran Aluminum Company.

354. It was explained that the aluminum company had been subjected to several air raids and had sustained considerable damage. The mission noted that considerable reconstruction work had taken place and there were visible signs of continuing activity in this direction. The mission observed that reconstruction work had been effected on the plant's three production lines, buildings and structures and the silos. At the time of the mission's visit the production output of the plant had been restored to its original capacity, i.e. 10,000 tons a day.

355. Four other industrial units, namely Azar-Ab Industries, Wagon Pars Co., Hepco heavy equipment production and Machine Sazi were all heavy industries that had been subjected to air attack and for periods were obliged to suspend or reduce production. It was quite evident to the mission that considerable repair and reconstruction work had been effected and all four plants were now producing at their original capacity.

356. The last industrial complex inspected by the mission was the Zob Ahan steel complex in Esfahan Province. The original production capacity of the complex was 1.9 million tons a year. It was stated that the plant had been attacked by aircraft in 1986 and that major damage had been sustained by the emergency power unit and by the warehouses. Lesser damage was sustained by the natural-gas line and some of the plant's equipment. The mission observed that all damage had been virtually repaired or reconstructed and that it was operating to capacity.

2. General observations

357. As with other sectors in the war-stricken provinces, the industrial sector sustained considerable damage during the course of the war. The magnitude of the damage varies among individual companies from moderate and severe in some cases to total destruction in others. In the case of industrial units located well away from the border provinces, the destruction has been relatively light except in the case of the industrial park at Arak.

358. The Islamic Republic of Iran's policy of maintaining the level of production in all sectors during the war was quite evident in the industrial sector. Units and complexes were reported to have been repaired several times after attacks in order to restore operations and maintain the maximum level of production possible.

359. The policy of keeping production units in operation had its own difficulties. Firstly, a great number of plants had been imported from abroad and it was most difficult at times to obtain appropriate parts or components to replace those that had been damaged. Consequently the plant personnel working closely with those in other related units were constantly obliged to improvize, using local material and local technology to the utmost. Many of these improvized parts will need to be replaced with parts from the manufacturer.

360. The mission noted that advantage was being taken of improving the level of technology wherever major reconstruction of a plant was required and where resources permitted. The mission was impressed by the importance and priority assigned to the reconstruction programme and to the restoration of basic infrastructure in each damaged locality. This has permitted the resumption of economic activities and the provision of basic services and facilities to the local population.

361. The mission was informed of the special arrangements being made by the Government to provide assistance to small companies in their reconstruction efforts. This has taken the form of grants, technical assistance and long-term concessionary loans.

362. The mission was provided with a large number of photograph albums to illustrate the type of damage that had been caused to particular industrial units and companies. Where reconstruction had taken place, photographs of the completed projects were provided.

3. Mining

363. Activities in this sector consist of the extraction of underground deposits (e.g. minerals, crude oil and natural gas) or surface deposits (e.g. gravel, sand and clay), as well as the processing of natural mineral deposits (e.g. the crushing, sifting or washing of such substances or any other operation which makes the substances marketable).

364. With regard to the extraction of crude oil and natural gas, the standard international classification system (SITC) has not been applied: instead of being included under mining, these activities have been assigned a separate category.

365. Mining sector activities are designed, essentially, to ensure the provision of raw materials for the metal-smelting and other national industries, as well as for the construction and housing sector.

Direct damage

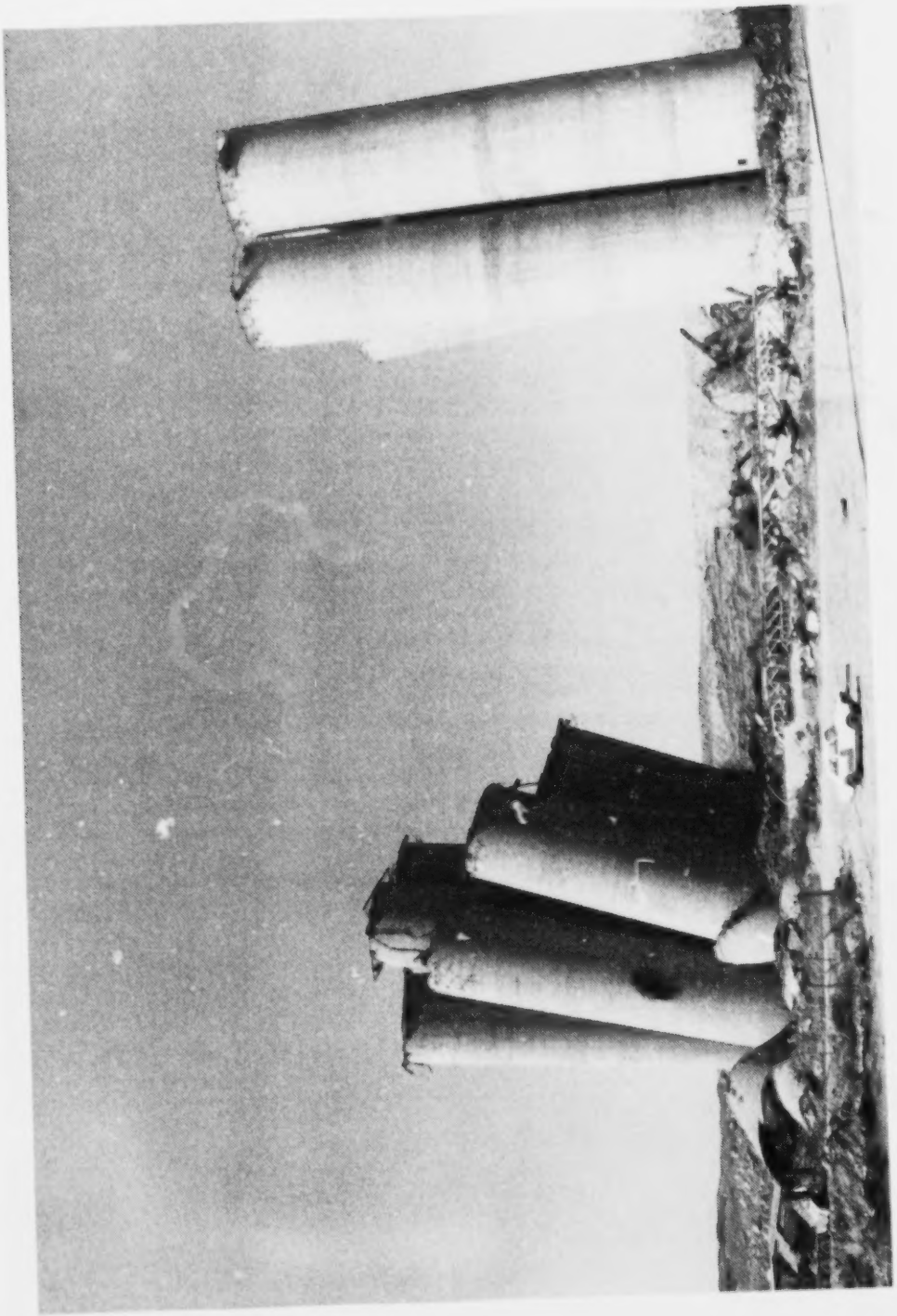
366. Direct losses to activities in the mining sector during the years of the war amounted to Rls 35,790 million, representing 0.1 per cent of total direct damage to economic activity over all (Rls 30,811,423 million).

367. The following is a breakdown of direct damage by subsector. The team was unable to carry out any on-site inspection of sites and facilities belonging to the mining sector. However, in its submission, the Government provided the following information, which will require further examination at a later date:

	Percentage	Millions of rials
Buildings and installations	53.67	19 209
Machinery and equipment	28.14	10 074
Materials and goods	18.18	6 507

Indirect damage

368. Indirect damage to mining activities amounted to Rls 23,410 million.



E. Power, telecommunications and broadcasting

1. Power

(a) Background

369. The Iranian national power transmission system has three separate grids and a number of isolated generating stations (diesel) supplying remote communities. The largest grid, which supplies 21 provinces, was repeatedly attacked during the war. The main installations affected were in the western provinces, Tehran province and other key installations in the north and centre of the country. The two other grids are relatively small and supply power to the eastern provinces of Khorasan, Baluchestan and Va Sistan. These did not suffer any direct damage as a result of the war.

370. The installed capacity, which has doubled since 1978, utilizes four distinct types of generation - hydro, steam, gas and diesel. The growth in each area is illustrated in the table below.

Year	Hydro MW a/	Steam MW a/	Gas MW a/	Diesel MW a/	TOTAL MW a/
1978	1 804	1 606	2 505	447	6 362
1982	1 804	4 040	2 554	642	9 040
1989 b/	1 824	6 598	2 595	280	11 297

Note: Figures do not include privately controlled power generation.

a/ MW = Megawatt.

b/ Does not include war-damage reconstruction.

371. The total installed capacity for the entire country at the end of the war was 14,282 MW, and it is reported that the annual growth rate in energy during the last 20 years has been 8 per cent. The Ministry of Energy had embarked on an ambitious construction plan prior to the outbreak of war to meet the increasing need of industry and that of the growing population. Despite repeated attacks on power installations, particularly in the central and south-western border regions, the ministry continued with its programme throughout the war.

Map 7

MAP NO 3642.9 UNITED NATIONS
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Map 8

MAP NO. 3642.2 UNITED NATIONS
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372. The present main transmission network consists of 400 kilovolts (kV), 230 kV, 132 kV and 66/63 kV transmission lines. The increase in length of the transmission lines is shown below (in kilometres).

Year	400 kV	230 kV	132 kV	66/63 kV
1977	651	4 017	3 044	5 691
1989	5 798	10 530	8 144	1 730

373. The dramatic increases are due to the rise in demand for power output and to heavy migration from war-affected provinces to the major consumer areas in the northern provinces and around Tehran and Esfahan. To meet the increased length of transmission lines it has been necessary to install a large number of new transformer substations.

374. In spite of the reconstruction efforts, the power output has not been able to keep pace with demand. A number of destroyed power units have yet to be replaced. Those that have been repaired are restricted to a lower capacity until the damaged transmission lines can be restored. This situation has caused considerable problems in the economic sector, particularly during summer months when demand peaks. To meet the continued growth in demand, the Ministry of Energy has reportedly awarded contracts to construct a further 9,000 MW of generating capacity and to expand the associated transmission systems over the next seven years.

(b) War-damaged areas in the energy sector

375. The Ministry of Energy stated that the main power network received extensive damage during the war years, particularly in the border provinces. Attacks were carried out on key power installations by artillery fire and by air and missile strikes. Moreover, installations and large power-generating stations well away from the conflict zone suffered damage as a result of repeated air sorties. Key installations in areas as far as Sari in the north, Esfahan in the centre and Shiraz in the south were subjected to attack.

376. In documenting details of the damage to the power network the Ministry divided the network into three divisions, namely, generation, transmission and distribution. Both generating plant and the transmission networks were deemed prime strategic targets, while the distribution system was considered a secondary target likely to be hit during attacks on urban centres.

(c) Power generation

377. Since power stations were regarded as strategic targets, attacks on them were not confined to the border provinces. For example, it was reported that the Neka power station, north of Tehran, which is the largest on the system (4 x 440 MW steam), was repeatedly attacked. Other stations also attacked ranged from Bandar-e-Abbas (4 x 320 MW steam) in the south and Tabriz

(2 x 378 MW steam) in the north-west. In addition to attacks on major installations in or far from the war zone, a considerable number of smaller stations close to key population centres were also reported to have been damaged.

378. Because of the time constraint, it was not possible for the mission to visit all damaged power stations. For this reason, a random sample of five stations was inspected. These included three steam-generation plants at Neka, Ramine and Zargon and two hydro plants, Martyr Abbas-Pour and Dez.

Neka power station (steam)

379. Neka is the country's largest power station and is situated on the Caspian Sea close to the city of Sari. It has 4 x 440 MW generating capacity and was completed in 1981.

380. The Ministry of Energy reported three major attacks on the station, the first in 1986 and the last in 1988, causing the station to lose 50 per cent of its generating capacity. Reconstruction work on the damaged facility began in 1987 and at the time of inspection the generating capacity was still reduced by 25 per cent.

381. The first attack in December 1986 damaged the No. 2 unit turbine hall. A bomb reportedly struck the building below the generator's foundations. This caused the main bearing pedestal to move and resulted in a bent rotor. Major damage was also caused to the stator. Blast damage also destroyed the excitation transformer and control room and the main condensate extraction system. The Ministry also reported severe damage to a number of turbine auxiliary systems and to the main hall area itself.

382. The second attack was reported to have occurred in September 1987. Although it caused only minor operational damage, it resulted in a large number of deaths among the personnel. The workshop and canteen/locker facilities were damaged.

383. The third attack in May 1988, damaged No. 3 unit boiler area and, in particular, demolished the top section of No. 3 chimney. Collapsing debris damaged large areas of the structural steel supports around No. 3 boiler. The main force draft fans were demolished and all the associated flue duct work was severely damaged. One bomb reportedly went through the first and second passes of the boiler tubing and landed under the main burner area. Fortunately it failed to explode.

384. The mission observed a large amount of physical and film evidence to support the damage claims. No. 2 unit turbine has still not been repaired. Attempts were made to do this locally, but the rotor and stator need to be sent overseas. No. 3 chimney has been repaired and there is physical evidence showing the sections repaired. The remains of large sections of damaged steelwork and ducts were seen in the station's junkyard.

Ramine power station

385. Ramine is a steam-powered generating plant which was to consist of 4 x 257 MW steam sets from the Union of Soviet Socialist Republics. No. 1 and No. 2 units were operational in 1981 and No. 3 and No. 4 units were to be commissioned in 1987. This power station was said to have been attacked eight times and extensive damage inflicted on all units and auxiliary plant. During an air raid in March 1986, No. 2 unit turbine was reportedly severely damaged. The unit was running at 257 MW when the attack caused the main steam line to rupture and the roof of the engine room to collapse onto the turbine. The turbine blades were damaged and the unit is not yet back on load. Subsequent raids reportedly damaged unit transformers, the water treatment plant, the main storeyard, fuel tanks and a considerable amount of auxiliary equipment.

386. The damage to the storeyard reportedly destroyed many vital components intended for the construction of No. 3 and No. 4 units. This has seriously hampered the reconstruction of No. 2 unit and the completion of No. 3 and No. 4 units. Since only one of four units is operational, the station is generating at 25 per cent capacity, which will increase when two more units become operational in 1992.

387. The mission inspected the site and found considerable evidence to confirm the damage sustained. The two units under construction were delayed for lack of vital parts; the debris is still evident in the damaged yard. No. 2 unit turbine is still under repair and the roof and associated plant has still to be restored. Burnt-out transformers, fuel tanks and isolated phase busbars (links between the generator and transformer that require special fabrication) are still in evidence in the station scrap yard. The Ministry produced photographic records and documents to substantiate its damage assessment.

Martyr Abbas-Pour Dam

388. This is the site of a 4 x 250 MW hydroelectric generating station, located in the north of Khuzestan Province. Construction was commpleted in 1977 and this station was in full operation prior to the outbreak of the war. Ministry reports show that this station was attacked four times and the primary target was the 400 kV switching yard. The switch gear was damaged in all four attacks, while two attacks caused damage to the engine house. One generator was reportedly damaged when a bomb entered an opening in the engine room and hit the overhead crane. Debris damaged the windings of a generator. Also damaged were a main transformer and switch gear. The switch yard had to be reconstructed after each attack to allow the station's generated capacity to be transmitted to the grid.

389. The mission found ample evidence of damaged switchgear equipment. Name plates show that replaced equipment had been damaged in subsequent attacks. Superficial blast damage was in evidence on the dam wall and burnt-out transformers are still stored adjacent to the engine house. At the time of the mission's visit, the station had been repaired and was operating at full

load. However, the mission was informed that the station had been operating at much reduced capacity and at times had been completely incapacitated because of the damage sustained.

Dez Dam

390. The dam feeds the hydroelectric power station with a capacity of 8 x 65 MW generators. It is situated near Dezful in northern Khuzestan Province and became operational in 1973. This station was said to have been attacked in 1986 and 1987, causing extensive damage to the 230 kV switch gear and transformers.

391. During the course of its inspection the mission was shown evidence to support this claim. Name-plate data indicated that the reconstructed equipment was itself damaged. Many temporary repairs are still evident in the enclosure. Burnt-out transformers and isolators have been kept as evidence.

Zargon power station

392. This is a mixed gas and steam turbine power plant situated 40 kilometres north-east of Ahwaz. It contains 2 x 147 MW steam sets and 4 x 32 MW gas turbines. The station was reported to have been repeatedly attacked. One of the steam sets that was under construction at the time is reported to have had its boiler house severely damaged. Repairs are almost complete and it is expected that the set will be commissioned in the next few months. One operating unit, which reportedly had its generator windings damaged, has also been repaired, and is now back in operation. Two of the gas turbines are still out of order.

393. The mission observed extensive damage to the gas turbine units. Two have been cannibalized to make the other units operational. There is evidence of blast and bullet damage to all units and to the tank farm. The junkyard holds the remains of damaged fans, boiler tubing, burnt transformers and transmission switch gear.

394. Initial observations in all five stations by the mission would seem to support the accuracy of the Ministry's physical damage assessment. Extensive disruption to the nation's generating capacity is still evident. The major problem is that many of the outstanding repairs require foreign equipment and expertise and this is hampering the reconstruction programme.

(d) Transmission

395. As the large 400 kV, 230 kV and 132 kV lines link all the power stations to the grid, the main substations and lines could also be regarded as strategic targets. Severe disruption to the network can isolate the power stations at the extremities of the grid, with the resultant inability of the system to meet demand in the central cities such as Tehran. Damage to the larger line network (400 kV and 230 kV) can require transmission to be carried out on the lower voltage network. At lower voltages power cannot be

transmitted over large distances without causing severe losses in energy and/or the complete inability of the smaller line to carry the required load. Again demand may not be met in certain areas.

396. During the conflict the 400 kV system in the Tehran region was linked to the southern provinces by two lines. Both those lines converged at one substation, in the central region, at Angirak. This station was repeatedly damaged by attacks. With this 400 kV north-south link out of action, the load had to be carried by the lower voltage networks.

397. As the transmission network covers vast regions, it was not possible to visit all damaged locations. The mission concentrated on the Khuzestan region and also visited Kangawar in Bakhtaran. Thirteen sites, ranging from 400 kV to 132 kV, were visited along with seven transmission lines connecting the substations. The substations were located in the cities of Ahwaz, Abadan and Khorramshahr and are shown in table 12, which also contains a damage assessment by the Ministry of Energy. Burnt-out transformers, shot-up switch gear and demolished towers have been reported and observed in most areas. Many of the control buildings have been severely damaged and show evidence of both air and shell attacks. Although most stations have undergone some reconstruction and are operational, on-site inspection of these stations by the mission tends to support the assessment of damage stated.

398. Direct damage to transmission lines mostly occurred in the border provinces, particularly in areas where land fighting took place or that were occupied by the opposing forces. The 132 kV double-circuit line from Ahwaz to Abadan running along the railway line has had to be virtually rebuilt. The area was occupied and the vast majority of the towers were reportedly destroyed. The mission observed the relocation of the towers and the original foundations along a 50 kilometre stretch of line. Table 13 shows a list of other damaged circuits.

399. The Ministry of Energy reports that similar damage has occurred to the secondary substations in the other border provinces, as well as to a number of 400 kV stations linking the main consumer areas of Tehran, Esfahan and Khuzestan. Repair to the damage to the transmission infrastructure in Khuzestan Province has been given high priority since the region is the main oil-producing sector and power is needed to keep the vital oil supplies flowing. In the repair process many of the damaged substations could only be given "band-aid" treatment and they will need more permanent rehabilitation.

Table 12. Substations - Khuzestan

Substation	Capacity MVA	Voltage (kV)	Damage assessment (percentage)
Diesel Abad, secondary	1 x 27	132/11	100
Saddeh, secondary	1 x 27	132/11	100
New Abadan, secondary	2 x 27	132/11	70
Ahmad-Abad, secondary	2 x 16	132/11	100
Khorramshahr, No. 1, secondary	2 x 16	132/11	100
Pirooz, secondary	2 x 16	132/11	100
Zolfighari, secondary	2 x 27	132/33	90
New APC Abadan	2 x 27	132/11	100
Khorramshahr, No. 2, secondary	2 x 27	132/11	100
Abadan, main	2 x 120	230/132	90
Navard, main	3 x 50	230/132	40
Ahwaz, No. 2, main	2 x 200	400/230	70
Kangawar, main	2 x 120	230/132	100

Table 13. Damaged transmission circuits - Khuzestan

Circuit	Voltage (kV)	Length (km)	Damage assessment (percentage)
Ahwaz-Abadan (double) a/	230	120	80
Mahshahr-Abadan (double)	230	90	70
Ahwaz 2-Navard (double) a/	230	35	30
Malishahr-Abadan (single)	132	90	50
Ahwaz-Abadan (double) a/	132	92	45
Abadan ring (double) a/	132	60	90
Andimesk-Dehloran (single)	132	116	25

a/ Inspected by the mission; an initial survey shows there is evidence to support the Ministry of Energy assessment.

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(e) Distribution

400. The distribution networks were reported to have sustained damage in two ways - by air assault (missile and bomb) and by ground assault (artillery and troop engagement). Attacks on cities and towns resulted in heavy damage to the infrastructure, including the electrical distribution system. Government figures show that in areas where damage to housing was the greatest, the electrical distribution system received proportionate damage. The distribution networks in the border provinces of Khuzestan, Bakhtaran, Ilam and Kordistan suffered heavily, particularly in towns that were occupied by the invading forces. In large areas of the border provinces, particularly those previously occupied by opposing forces, repair and reconstruction has yet to take place. However, in other areas some damaged sites had either been repaired or were presently under reconstruction. The Ministry of Energy has given two main reasons for assigning high priority to this work:

(a) The Government's desire to rebuild the infrastructure in the damaged areas as quickly as possible with the aim of revitalizing the economy, restarting industry and facilitating the restoration of public services;

(b) The fact that materials required for the reconstruction of the electrical distribution system can be locally manufactured, i.e. overhead lines and cables, distribution transformers and accessories and poles.

401. The mission visited a number of regions to ascertain the damage to the local distribution network and reconstruction work in progress.

Abadan

402. This city has suffered severe ground damage to the general infrastructure (water, electricity, telecommunications, etc.). Large areas of the city were completely levelled and all overhead cable networks have been destroyed. A large quantity of 11 kV distribution transformers show evidence of damage - bullet holes, shell damage, etc. Reconstruction has commenced but the task is formidable. The Ministry of Energy estimates that over 80 per cent of the city's distribution network needs to be replaced.

Khorramshahr

403. The whole infrastructure of the city has been destroyed. All overhead and underground routes will have to be replaced. In conjunction with the other services, a coordinated approach is being taken to repair the cable ducts and overhead networks. Some reconstruction has taken place and new concrete poles carry power to rebuilt areas. The Ministry of Energy estimates that almost 100 per cent of the network needs to be replaced.

Border towns

404. The mission visited the border towns of Bostan and Howeyzeh in Khuzestan and Qasr-e-Shirin in the province of Bakhtaran. All were totally destroyed to the extent that very little remains untouched and standing. The complete local power network has been destroyed and only recently has power been restored in Bostan and Howeyzeh. The Ministry of Energy has estimated the damages at 80 per cent in Bostan and 100 per cent in Qasr-e-Shirin.

405. In the Khuzestan region alone the Ministry of Energy estimates the damage to the power distribution network to be as follows:

Medium-voltage lines	2 680 kilometres
Low-voltage lines	1 855 kilometres
Consumers affected	85 586
Transformers destroyed	3 384
Underground cable	151 kilometres

(f) Reconstruction in the energy sector

406. Electric energy has become vital to the modern way of life and without it the major industries and the domestic user would find their daily routine severely disrupted. For these reasons repairs to the generating stations and to the transmission system were given priority by the Government.

407. Much of the equipment used in these two areas however is manufactured outside the country and, in the case of large generators and turbines, the construction time can be in excess of two years. Delays also occur when dealing with foreign firms because of the long list of prior orders from other countries.

408. Where possible the Ministry of Energy has tried to repair and reconstruct vital elements using local materials. Much of the structural repair to power stations and transmission substations was completed in this manner, even prior to the 1988 cease-fire (the Abbas-Pour's generator is a case in point). Not all attempts at local improvization have succeeded however. The turbines and generators at Neka, Ramine and Zargon are still out of commission despite repeated attempt to repair them.

409. Repairs to the transmission system were started immediately after the first damage was sustained. Replacement parts were initially available from unaffected regions, but eight years of conflict soon exhausted those supplies. Although some imported material was made available, many of the repairs to the 230 kV and 132 kV (secondary) substations have been temporary in nature. These emergency-type reconstructions are still evident in many regions; fused links are used in place of circuit breakers, which means the

system protection is dependent on relays in main substations, thereby making severe damage to the system likely.

410. The repairs at Kangawar have utilized a complete transform/switchgear arrangement mounted on a flatbed trailer. This can be moved into a damaged location quickly and once the overhead lines are repaired the substation is operational. The majority of substations on the system are manned and the control of the network is done by telephonic communication rather than from remote-control centres. In many of the damaged substations the control and protection wiring is still under repair and a new system control and data acquisition control system would require a large foreign currency component that would delay reconstruction. Therefore as human resources are available and relatively cheap, in the short term it is simpler and expedient to man the stations rather than install the automated control systems.

411. The distribution networks have also been largely reconstructed. Much of the material and equipment is now manufactured in the Islamic Republic of Iran. Imported wooden poles have been replaced by Ministry of Energy-designed concrete ones and the distribution transformers and cables are also made locally. This access to local material greatly increases the efficiency of the reconstruction. In the devastated towns of the border provinces a coordinated approach to infrastructure rehabilitation is under way. Networks for cable ducts and overhead lines are being reconstructed in conjunction with the telecommunication sector.

412. In the cities the distribution networks have been reconstructed in devastated neighbourhoods. It was Ministry of Energy policy to install the vital infrastructure utilities of electricity and water in these localities prior to rebuilding the houses. The mission observed large areas of Abadan and Khorramshahr with newly installed distribution networks that are operational although no housing reconstruction has as yet taken place. In other border regions of Bakhtaran the new networks have been installed and house-building is under way. The number of returning residents is however still low and hence the demand for energy is low.

413. As stated previously, with the annual growth rate in electricity consumption averaging 8 per cent, the Ministry of Energy has endeavoured to keep its construction programme ahead of demand. The mission was provided with the Ministry of Energy demand forecast and construction programme for the next five years and this has been placed on file for future reference.

2. Telecommunications

(a) Background

414. The Telecommunications Company is responsible for all aspects of the Iranian national network. Its activities include the planning, development, operation and maintenance of the national network. In 1979, the company had about 400,000 subscriber lines in Tehran and 400,000 lines in 76 other cities

and towns throughout the country. By 1990, 595 cities and towns had been equipped with automatic telephone exchanges and 400 of these have direct access to subscriber trunk dialling. The number of subscriber lines now exceeds 2.2 million. The telecommunications network, which was planned over 10 years ago, has been developed steadily to its present state.

(b) Networks

415. There are several separate networks, public switched telephone, telex and telegraph and private systems. The largest single sector is the public switch telephone network. The installed exchanges are mainly of the electromechanical type with some semi-electronic and wired logic exchanges. The national network hierarchy uses a 3-level structure consisting of 6 secondary centres, 29 primary centres and 400 terminal exchanges. There is also an international switching centre in Tehran capable of handling 1,300 channels.

416. The telegraph network comprises national and international sections. The national and international sections both consist of point-to-point telegraph and Gentex between cities, and direct or indirect connection to other countries. There are telex exchanges in Tehran and nine other cities that are computer controlled and serve 12,400 subscribers. Tehran centre is the only link to the international network.

(c) Transmission systems

417. In order to link the various town and city networks, different types of systems have been employed that have been continuously expanded over the last 10 years. There are two distinct types, high-capacity and low-capacity systems.

418. The high-capacity systems include fibre optics, coaxial cable and analog/digital microwave. Microwave forms by far the largest transmission network. This network was primarily affected by the war, particularly in the western border areas. The system utilizes FM modulation and many of the affected areas were operational prior to the 1981 war with Iraq.

419. The low-capacity transmission systems used in the network are mainly very high frequency (VHF) and ultra high frequency (UHF) radio systems, carrier systems, overhead cables and pulse-code modulation transmission systems. In many areas these low-capacity systems have reportedly replaced the high-capacity systems in war-damaged regions.

Map 9

MAP NO. 3642.15 UNITED NATIONS
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420. The international telecommunication link prior to 1981 utilized a microwave link to Kuwait, Turkey and Pakistan. The main link, however, was via a single 800-channel Earth satellite station. This used three to five transponders of the Intelsat system. Iran was linked via this station to satellites covering both the Atlantic Ocean region and the Indian Ocean region.

(d) War damage in the telecommunications sector

421. The vast majority of the damage was confined to the western border provinces of Khuzestan, Ilam, Bakhtaran, Kordestan, West Azerbayjan, Hamadan and Lorestan. Other areas remote from the western border experienced damage as a result of bombing of cities, towns and other vital installations.

422. The Government has reported damage to (a) local distribution networks, (b) transmission system, and (c) the satellite Earth station.

Local distribution networks

423. The Telecommunications Company reported extensive damage to telecommunications facilities in most cities, towns and villages. The mission made on-site inspection visits to Khorramshahr, Abadan, Dezful, Susan-Guerd as well as to a number of villages to ascertain the situation on the ground.

Khuzestan Province

Khorramshahr

424. The Telecommunications Company informed the mission that, during the course of the war, particularly during the city's occupation by Iraq, the telecommunications systems sustained extensive damage. The main exchange and administrative buildings were reported to have been totally destroyed and the exchange equipment severely damaged. The site was visited by the mission, which observed the new exchange building now complete on the site of the old unit. All other buildings in the neighbourhood had been completely demolished along with other elements of the local infrastructure. The Telecommunications Company building, with a new electromechanical exchange with a capacity for 10,000 lines, is presently the only usable unit for 2 square kilometres.

425. All overhead lines and cable ducts were damaged and the Telecommunications Company, in conjunction with the other services, is now installing a new underground network. Many old sections of ducts are filled with water and the vast majority of distribution junction boxes have been destroyed. The damage in the area is assessed at 100 per cent.

426. The port area of the city has been virtually levelled and the Telecommunications Company warehouse and stockyard have been destroyed. The remains of burnt-out cable drums are still evident in the yard.

Abadan

427. The mission was informed that Abadan was one of the 29 primary centres in the Telecommunications Company network and at the outbreak of the war it possessed two exchange centres that catered for up to 1,300 lines and 800 subscriber trunk dialing channels. As a result of the war the main exchange buildings and administration offices were severely damaged. All exchange, radio and operating consoles were totally destroyed. According to the Telecommunications Company, over 350 kilometres of cable network and 62 public telephones were also damaged beyond repair.

428. The mission visited the sites and found evidence of severe damage to the exchange buildings and all offices have now been rebuilt. The urban ducts and cable routes were severely damaged and many faults have been experienced in the cable system. The system is now being replaced by new cable networks and junction boxes. All exchange equipment is new and manufactured under licence in the Islamic Republic of Iran. Building damage is estimated by the Telecommunications Company at 50 to 70 per cent, while equipment damage is assessed at 100 per cent. From the ruins seen by the mission, this assessment appears reasonable.

Dezful

429. The mission visited the city and observed extensive damage to the telecommunications infrastructure. Complete sections of the city, particularly those close to the airfield, had been levelled. The exchange building had been reconstructed and the main electromechanical exchange repaired. The mission estimates the damage to equipment as severe and to cable distribution as moderate.

430. The mission also inspected the cable distribution network within the city, both the underground and the open-wire systems, which had been reportedly damaged by air attacks. Repairs have already commenced, but it will be some time before the work can be completed.

Susan-Guerd

431. This small town was damaged early in the war and was also part of the occupied lands that extended from the border to within 30 kilometres of Ahwaz.

432. The exchange and maintenance buildings suffered moderate damage, while the equipment damage to the exchange and cable network has been estimated by the Telecommunications Company at 50 per cent. Reconstruction is at an advanced stage, making assessment difficult. There is evidence of damage caused by bomb and shell attacks at each location.

Rural villages in Khuzestan Province

433. The Telecommunications Company reported that extensive damage had been inflicted in the border villages. In the occupied areas the telecommunication facilities had been totally destroyed. Prior to the war, generally speaking, each village/town contained an exchange and administration building, a 200-line exchange and 20 to 30 kilometres of open-wire cable network.

434. The mission visited two villages in the area, Bostan and Howeyzeh and both show evidence of complete destruction. Areas of Howeyzeh have not been reconstructed so the damage can still be seen. New buildings at different locations have been built and temporary exchanges and lines have been installed.

(e) Other border provinces

435. Because of time constraints, the mission visited only one site in Bakhtaran, namely Qasr-e-Shirin. The Telecommunications Company reported that extensive damage occurred in the other western provinces on a scale similar to that of Khuzestan, and that Ilam and Bakhtaran were badly damaged.

Qasr-e-Shirin

436. It was reported that in 1981 this town had a 1,000-line exchange housed in an administration building. The telephone cable network extended for over 25 kilometres. The mission visited the town and found that, apart from the mosque, every building had been levelled during the conflict. None of the equipment remains.

(f) Transmission network

437. The analog microwave network has been operational since the early 1970s. The system has been expanded in a number of phases and by 1981 most towns and cities in the western border regions were linked by either high-density or medium-density microwave routes.

Khuzestan Province

438. The border areas of this province were said to have been extensively damaged and the microwave network repeatedly attacked.

439. The Ahwaz-Khorramshahr-Abadan route followed the railway line from the twin ports to Ahwaz. This region was occupied by Iraqi troops in the early part of the war. The mission visited the region and found that the repeater stations at Daub and Khorramshahr North had been completely levelled. The Khorramshahr North repeater station sustained severe damage and no buildings or equipment remain intact. Remains of tanks and shells were found scattered all over the site.

440. The Khorramshahr terminal microwave station included two towers and two dishes - one directed at Kuwait and the other at Abadan. Both have been demolished and the buildings destroyed. The Telecommunications Company has replaced the route by installing a new microwave terminal at Abadan and utilizing two links, one to Ahwaz and the second to Kuwait.

441. The Abadan microwave station, which was linked by a medium-density route from Khorramshahr, was visited by the mission. This building has been reconstructed on a different site and hence the extent of the war damage to the previous structure could be observed. The microwave antenna tower was severely damaged and the top section had collapsed along with the dish. The main exchange building was badly damaged and the walls riddled with shell and bullet holes.

Ilam, Bakhtaran and Kordestan Provinces

442. Other microwave stations in these border provinces have been reportedly severely damaged on a scale comparable to that inflicted on installations in the south-west of Khuzestan.

443. Stations at Mehran in Ilam and Qasr-e-Shirin and Eslam-Abad in Bakhtaran were said to have been totally destroyed. Repairs have already begun but it will be some time before the work can be completed.

444. In Kordestan, the Telecommunications Company also reported severe damage (between 40 to 60 per cent) to equipment and buildings in Vazaneh, Baneh and Sanandaj. These sites could not be visited by the mission during the tour of inspection.

Other provinces

445. The Telecommunications Company reported damage to its installations in other provinces, particularly in the west and central areas. The extent of the damage to equipment and buildings ranges from 5 to 35 per cent. Owing to time constraints, the mission could not visit those sites.

(g) Satellite Earth station

446. Apart from the microwave links to Turkey, Kuwait and Pakistan, the Islamic Republic of Iran's main international link at the outbreak of war in 1981 was via the lone satellite Earth station at Asadabad near Hamadan city. The Telecommunications Company informed the mission that the Earth station was attacked twice, 24 days apart in June/July 1985. There were two type A 30-metre antennas and one type B antenna operating 800 channels; the system used transponders on two Intelsat satellites. One was positioned towards the Atlantic Ocean region and the other faced the Indian Ocean region.

447. The Telecommunications Company reported that all three antenna were damaged. The two A-type 30-metre dishes were so badly damaged that they could not be repaired. The B-type has been repaired and is now operational. Along

with the antenna damage, buildings, power generation equipment and control panels suffered varying degrees of destruction.

448. The mission visited the site and observed one 30-metre antenna still damaged. The area showed signs of bullet and shell damage. The foundations of the support building were damaged and hence the antenna could no longer be aligned correctly. All buildings showed signs of attack and the roof of both the generator house and the power control room had been replaced. A new 16-metre antenna has replaced one of the destroyed type A dishes, while the B-type dish has had panels repaired and replaced. Damage to the various components ranges from moderate to heavy.

449. The station now has a capacity for 500 channels and 2 new alternative sites have been constructed to provide more secure international links.

(h) Reconstruction in the telecommunications sector

450. It has been the Government's policy to reconstruct any damaged network in the telecommunications sector as quickly as possible. Reconstruction commenced during the war and continued at an increasing pace after the cease-fire.

451. Many of the electromechanical exchanges and some of the microwave transmitter systems are made under licence in the Islamic Republic of Iran. This has simplified the repair programme. Elements of the equipment, however, can be acquired only from international markets and therefore it has taken time for repairs to be completed.

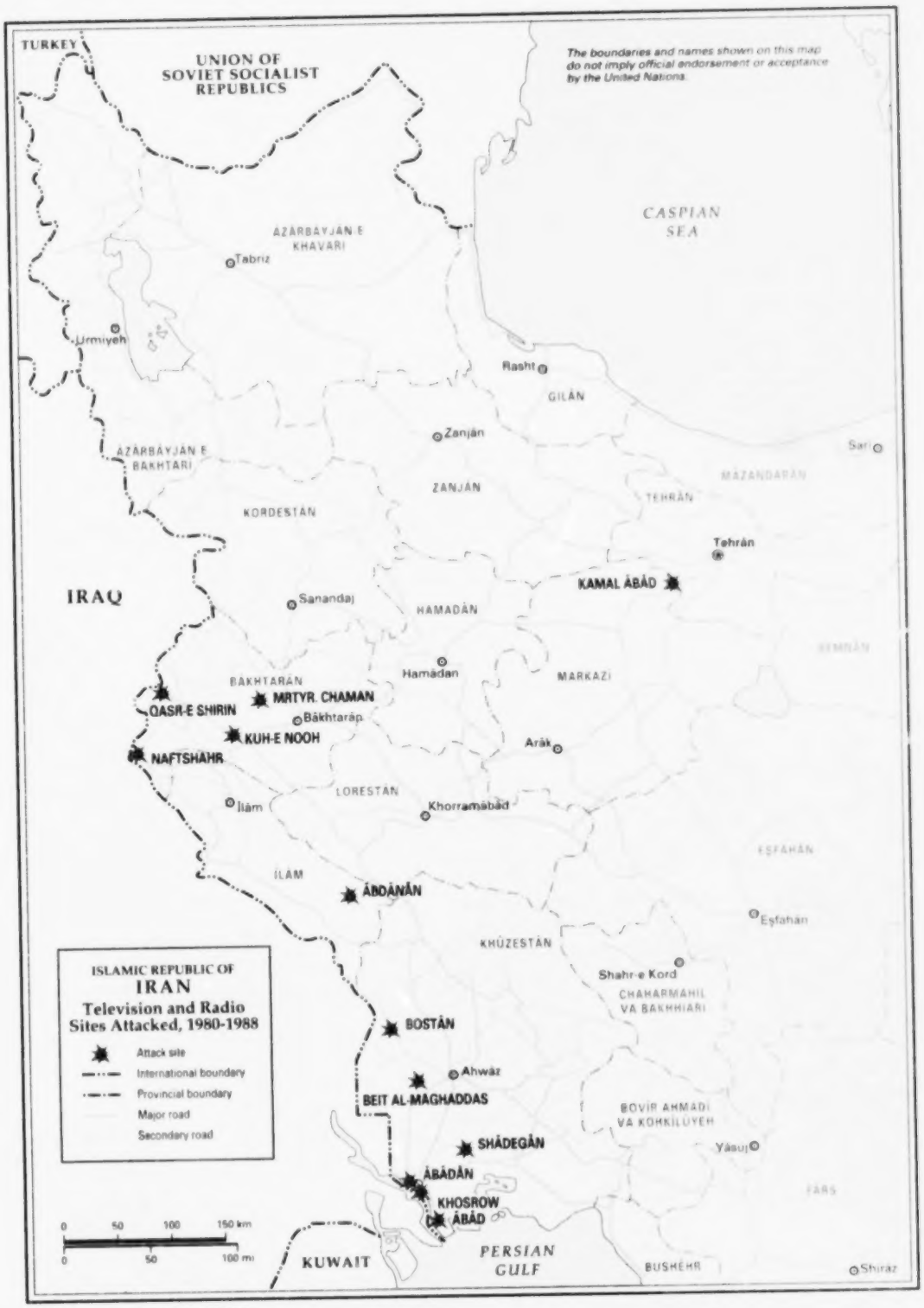
452. At present, quite a number of small towns and villages have been reconnected to the system via open-wire low-density cable networks. These, in turn, have tended to restrict the quality and availability of the service in many rural areas.

453. The reconstruction programme has become part of the Government's telecommunication development plan and in the process has become subject to the latter's procedures and priorities with regard to resources. Inevitably, delays have been encountered in modernizing the national networks and at present only a few areas have begun to be converted to digital exchanges (Tehran and the other large cities).

3. Radio and television

454. Broadcasting in the Islamic Republic of Iran is carried out under the authority of the Islamic Republic of Iran Broadcasting (IRIB). A nationwide radio network provides coverage for 95 per cent of the population. This coverage utilizes channels operating in the short-wave (SW), medium-wave (MW) and frequency-modulation (FM) ranges. In addition, IRIB operates two television networks, TV One and TV Two, which are available for 74 per cent and 45 per cent of the population respectively.

Map 10



MAP NO. 3642.6 UNITED NATIONS
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455. The two television networks and the MW and FM radio networks were designed and installed primarily for coverage within the country. The high power radio transmitting stations at Abadan (FM), Qasr-e-Shirin (MW) and the SW transmitters in Kamal-Abad, were mainly used for the external broadcasting services of IRIB.

456. Approximately 50 per cent of the population lives in rural areas, scattered over 60,000 villages. Because many lack the basic reading and writing skills, the broadcasting services for them are the most important information-delivery media in the country.

(a) War damage in the broadcasting sector

457. The vast majority of war damage was confined to the border provinces of Khuzestan, Ilam, Bakhtaran and Kordestan. Only one other central site was attacked and that was the SW radio transmitter station of Kamal-Abad which is situated at Karaj, about 50 kilometres from Tehran.

458. Attacks resulted in reported damage to high-power radio stations, high-power television and FM stations, and to radio and television programme production centres. Every effort was made to repair damage as soon as it occurred to ensure the continuity of broadcasts.

459. The mission visited 9 of 13 sites where installations belonging to the broadcasting sector had been reportedly damaged.

(b) High-power radio stations

Martyr Chaman Station

460. This site is a hilltop MW transmitter station designed to reach approximately 1.5 million people in four border provinces. It was constructed in 1981 and became operational in the same year. The site is situated some 50 kilometres from the city of Bakhtaran. The station originally had 3 x 100 kW transmitters, 1 x 50 kW transmitter, two antenna towers (120 metres) and one diesel generator.

461. The mission observed that both antennas had been destroyed, together with the diesel generator set. Severe damage had been inflicted on the buildings. A new station has been reconstructed with a new 120-metre antenna; the equipment is now located in underground shelters.

Beit-Al-Maghaddas MW station

462. This station is situated on the Ahwaz-Khorramshahr road and broadcasts to over 2 million listeners in Khuzestan and surrounding provinces. It became operational in 1982 but the region was occupied shortly thereafter. Its equipment included two transmitters, two 130-metre antenna towers and one diesel generator.

463. On-site inspection by the mission showed that both towers had been destroyed and there was no sign of the transmitter, which it is believed had been removed by the occupation forces. Only elements of the diesel generator house and transmitter buildings remain. Two new towers have been constructed on adjacent sites and the new generator and transmitter equipment rooms are now housed in underground bunkers.

Abadan MW transmitter station

464. The Abadan transmitter station, operational since 1975, is located to the east of the city and reaches over 4.8 million listeners. The station's equipment included two transmitters (400 kW), two antenna towers (130 metres) and one large (1.2 MW) diesel generator. During the war the station was said to have been occupied and as a result all of its equipment and buildings were reportedly damaged or looted.

465. The site was visited by the mission and remnants of the two antenna towers and their bases were observed. Damaged equipment was available for inspection. The area still contains unexploded live bombs just outside the site's boundary walls.

466. The mission observed that a building housing new transmitter equipment and containing new television and radio studios had been constructed on the original site.

Qasr-e-Shirin MW transmitter station

467. This station was built in 1970 to reach over 2 million listeners in Bakhtaran and neighbouring provinces. It also had the capacity to broadcast externally to Iraq. The original site contained two transmitters, two antenna towers and two large 1.2 MW diesel generators.

468. The mission visited the site and, in common with the rest of the area, found it totally devastated. Only the diesel generator engine blocks remain. The rest of the site had been levelled. Reconstruction has recently started.

Kamal-Abad SW station

469. This is an SW transmission station located at Karaj just 50 kilometres from Tehran. IRIB reports that it was attacked once and two curtain antennas were destroyed. The buildings were only slightly damaged, and IRIB assessment of damage to equipment was 30 per cent. The site was not visited by the mission.

(c) High-power television and FM stations

Khosrow Abad

470. This station which serves 1.5 million people, is situated just outside Abadan and was operational from 1968. The site is reported to have contained four VHF television transmitters, six FM transmitters and two antenna towers (220 metres and 120 metres).

471. The mission found clear signs of severe damage, with wreckage and debris strewn over the site. The remains of exploded bombs were very much in evidence. IRIB has assessed the damage to the building at 60 per cent and equipment damage total. The site is under reconstruction but as yet not operational. The main television centre has been relocated to Ahwaz.

Bostan

472. This site became operational in 1970 and served approximately 150,000 people. Prior to the war, the equipment at the station included two VHF television transmitters, one 220-metre tower and one diesel generator set. The mission visited the site and found evidence of total destruction. Neither of the two buildings remains standing and the wreckage of their contents is scattered over a wide area. Reconstruction had not taken place.

Shadegan

473. This site's broadcast area covers the northern end of Khuzestan and was operational in 1980. Reportedly, equipment at the station included five television and four FM transmitters, one 200-metre tower and two diesel generators. This site was not visited by the mission. However, IRIB reported only minimal damage to buildings and equipment.

Bakhtaran and Ilam hill top sites

474. There were three hill top television and FM transmission sites constructed in the late 1970s to provide coverage in the provinces of Bakhtaran and Ilam. Each site, Abdanan, Naftshahr and Kuh-e Nooh, were reportedly attacked several times. Abdanan and Kuh-e Nooh were equipped with both television and FM transmitters and associated towers. Naftshahr contained five television transmitters and one antenna. Each site has its own power generators. All three stations were close to the border.

475. All stations were visited by the mission. They showed signs of severe damage; in one case the original tower was still in place but moderately damaged. Buildings at all sites had been severely damaged and abandoned. At Kuh-e Nooh the base pedestal of the new reconstructed tower shows signs of bomb and blast damage. Bomb casings were found scattered over the site.

476. New buildings now replace the destroyed ones and the rebuilt stations are expected to become operational by 1992.

(d) Radio and television programme production centres

Abadan

477. Before 1980 Abadan was the main regional programme production centre for Khuzestan and the south-west region. The centre was located next to the Telecommunications Company microwave transmission sites. It was severely damaged during the eight-year war, and has now been relocated at Ahwaz. The original Abadan centre contained two television studios and two smaller radio studios and associated equipment. The site also included an administration building and 17 residential houses.

478. The mission visited the centre and found the site and its surrounding area completely devastated. There was clear evidence of bomb and shell damage to buildings and equipment. The whole complex will need to be rebuilt.

Abadan Oil Company

479. The Oil Company had a small radio programme production unit in the city. The site was not visited owing to time constraints. However, IRIB has reported damage to equipment at 100 per cent and to buildings at 40 per cent.

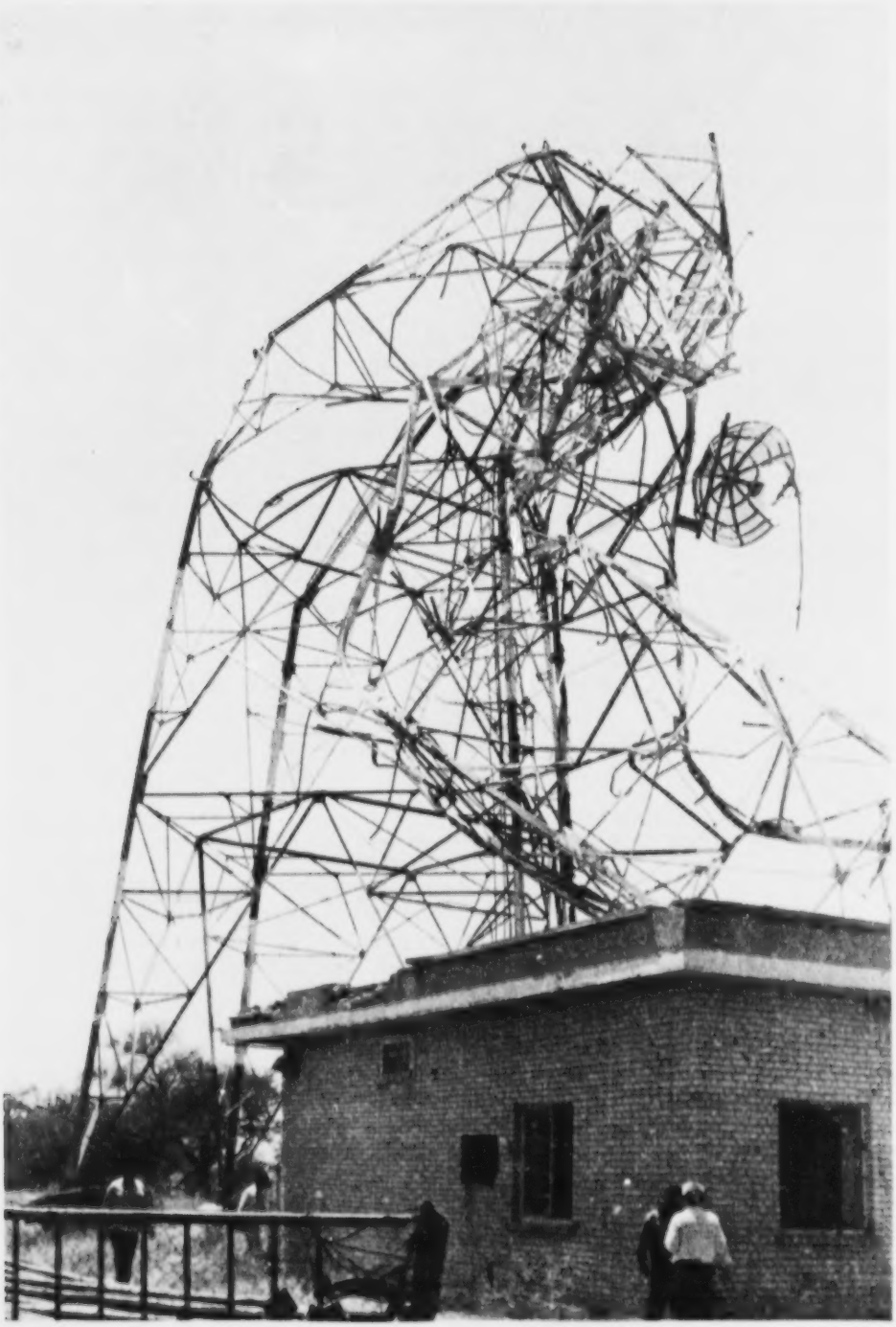
(e) Reconstruction in the broadcasting sector

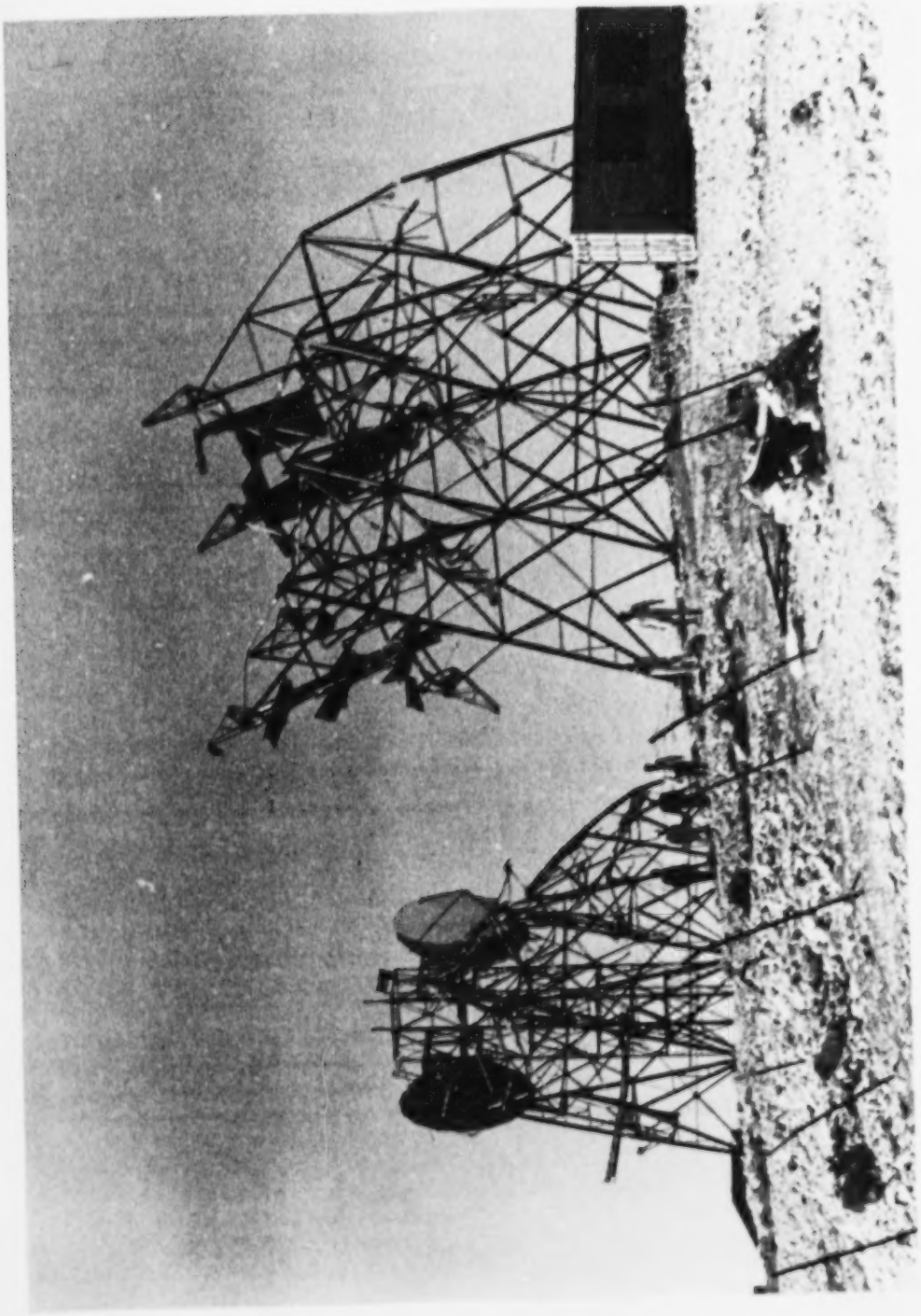
480. A large amount of reconstruction has already been carried out both during the war and since the cease-fire. The site visits by the mission confirmed that reconstruction to most damaged stations was in progress or had been completed. As previously noted, the rural population is largely illiterate and radio and television offer the most efficient and practical way of reaching them.

481. Because of the high priority given to this sector, the Government has gone to considerable lengths to ensure the permanence of the reconstruction of the radio stations, particularly of the Ahwaz MW radio site. Underground equipment and power generation rooms have been installed incorporating a large amount of new equipment. This equipment is of both external and local manufacture.

482. New production centres are under construction in Abadan to augment the upgraded Ahwaz studio. Reconstruction of the MW stations close to the western borders has slowly got under way. At Qasr-e-Shirin site, which was occupied for the duration of the war, the Government has commenced installing the foundations for a new city and for a new television transmission centre. Only at Bostan has reconstruction yet to start.

483. A large amount of machinery and transmission equipment was reportedly lost or destroyed and this will have to be replaced in order to allow operations and maintenance to return to normal. Some equipment can be manufactured in the Islamic Republic of Iran and some can be replaced from stores, but a sizeable quantity is still required from overseas. This replacement will require a substantial foreign currency component, which could slow down and reduce the effectiveness of the reconstruction programme.





F. Transport

1. Transport structure

484. The Ministry of Roads and Transportation has responsibility for all areas of the transport infrastructure. Deputy Ministers supervise all activities relating to road maintenance, planning, road design and construction, railway construction and administration. The Ports and Shipping, Civil Aviation, Meteorology and Railways administrations operate as semi-independent organizations, under the general control of the Ministry. In the case of Iran Air, Iran Road Transport, the Road Development Organization, Aseman Airlines and the Soil Laboratories, each operates as a semi-governmental company under the umbrella of the Ministry.

2. War damage in the transport sector

485. In its inspection of damaged sites the mission visited three major ports and five airports, travelled over 1,000 kilometres of road by car and viewed a further 500 kilometres by low-flying helicopter. The mission also inspected three major and three minor railway stations and 60 kilometres of track, four major railway bridges and 30 major road bridges. Attempts were made to verify all severe damage reported by the authorities by inspecting the damaged structures and reconstruction work. The inspection was aided by photographs taken at the time of the alleged damage.

486. Most of the damage in the sector was quickly repaired during the war, for obvious reasons. These repairs were however temporary and often "band-aid" solutions. In many instances the repaired facility is already showing signs of failure and a large-scale programme of permanent reconstruction will be required.

(a) Ports

487. At the outbreak of the war in 1980 the most important international port in the Islamic Republic of Iran was Khorramshahr on the Shatt al-Arab waterway, followed by the ports of Bandar-e-Emam Khomeyni, Abadan, and Bandar Abbas, on the Persian Gulf, and by the port of Bandar-e-Torkaman on the Caspian Sea. There were also other smaller ports important to the fishing industry (Arwand Kenar, Bandar-e-Deylam and Bandar-e-Bushehr) as well as the important oil-export port on the Kharg Island. The total throughput of the Persian Gulf ports in 1980, excluding oil, was about 20 million tons consisting primarily of general cargo, machines and machine parts and foodstuffs.

Map 11

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488. The mission visited three major ports in the Khuzestan Province, namely: Khorramshahr, Abadan and Emam Khomeyni, and the mission's observations on each of them are described below in detail.

489. The general cargo port at the oil-loading terminal of Kharg Island was also destroyed, this is discussed in the oil and petroleum section of the present report.

490. The mission was unable to visit the fishing port of Arwand Kenar which was the scene of fierce ground warfare and suffered severe damage. The port's small (80-metre) jetty and other basic facilities were reportedly completely destroyed. The mission was given plans of all ports it had visited that show the facilities and installations in place in 1980.

Abadan port

491. Abadan port is situated on the Shatt al-Arab waterway. The port is small compared to Khorramshahr with only four 5-metre deep berths. It operated as an international port for general cargo and passengers and, in 1980, had a passenger terminal, administration buildings, customs and other facilities, offices and warehouses and limited cargo-handling facilities. It handled mainly Persian Gulf shipping, with ships of up to 2,000 tons, and had a total area of 40,000 square metres. The adjacent oil-cargo-handling port belongs to the national oil company and has six deep-water berths with provision for container loading.

492. The port was reportedly under continual bombardment throughout the war and was completely destroyed. All buildings are severely damaged, jetties destroyed and open areas cratered. The port will require complete demolition and reconstruction.

493. The adjacent oil-cargo port was not inspected but it was reported to have been similarly damaged.

Khorramshahr port

494. Before the war this international port was the major port in the Islamic Republic of Iran for non-oil cargo and passengers. The port had thirteen 8-metre deep berths and covered a total area of 9 square kilometres. It also had a passenger wharf, a shallow small boat wharf and a container terminal.

495. There were extensive warehousing facilities (170,000 square metres) and uncovered storage space (50,000 square metres) and a large customs and administration complex. Other services included marine repair, fire fighting and safety, rail tracks connecting the main Ahwaz line and modern (1980) loading and unloading facilities. In 1979 the total throughput of this port and Abadan was reported to be 6 million tons.

496. During the invasion, the 500-day occupation, the liberation and the subsequent six-year bombardment, the port suffered total destruction. Not one

building is repairable and most are razed. The port is a total loss and will need to be levelled and built afresh. The majority of the berths are irreparably damaged or completely silted and all equipment has been destroyed or plundered. The mission was informed that at the time of the invasion there was a large amount of cargo in storage, including 2,000 new motor vehicles, foodstuffs and machine parts, and that this was plundered by the invading forces. The mission was not in a position to verify the loss, although it did observe some machine parts and other cargo scattered around the area.

Emam Khomeyni port

497. This port, situated in the Musa channel at the head of the Persian Gulf, is at present the largest port in the country. It is relatively new, having been developed in 1976 and expanded during the war.

498. The port has 28 deep-water berths (6,800 metres) with a subsidiary shallow-water jetty, barge harbour and ship-repair facilities. The port has extensive marshalling yards and tracks connected to the Ahwaz - Bandar-e-Emam Khomeyni line; these tracks service both the jetty and customs areas. The port has a rated capacity of 3 million tons, but can reportedly operate at a higher level.

499. There is a total of 265,000 square metres of closed storage and 800,000 square metres of paved open storage with a further 168,000 square metres of container storage.

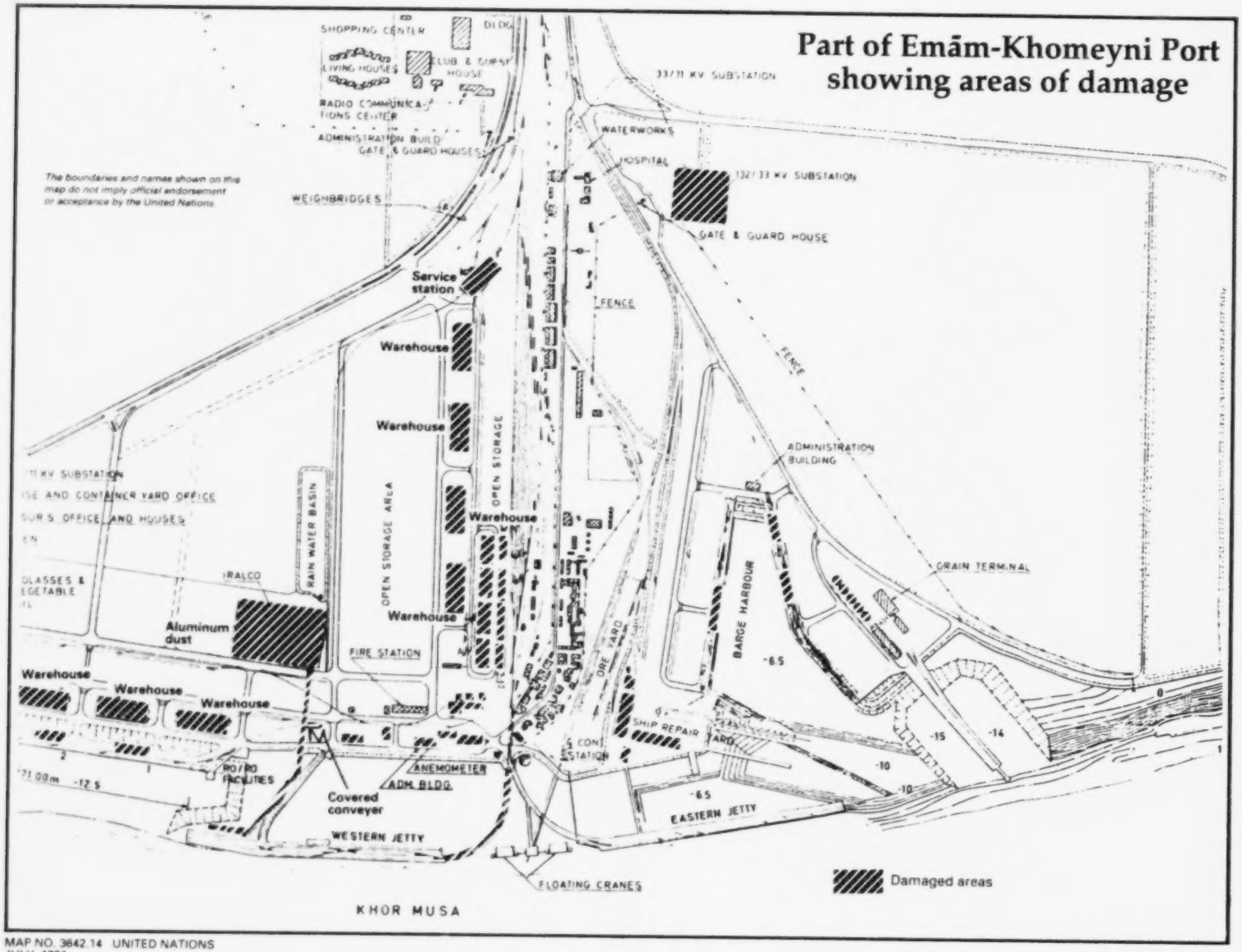
500. The port has grain silos, aluminium dust conveyor loading and storage, as well as general cargo handling facilities.

501. The port reportedly received many air attacks during the war. Most damage has been repaired, some of it temporarily, and the port is now capable of working at full capacity. In the course of its visit, the mission inspected a number of damaged sites and installations and prepared notes on each one for record purposes.

Equipment

502. In the ports subsection there has been a reported massive loss of equipment and materials, in particular from Khorramshahr and Abadan. Both port handling and loading equipment and cargo in transit were reportedly damaged, destroyed or plundered. A list of losses from Khorramshahr port was presented to the mission by the Iranian authorities. Whilst the losses cannot be confirmed by the mission, the size of the ports, the facilities available in 1980 and the amount of destroyed equipment still at the port site would tend to confirm the accuracy of the equipment list. A verification of the cargo will require closer examination of invoices and other documents, although many of these may well have been lost in the destruction of the ports.

Map 12



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Marine loss

503. There are many sunken ships in both the Karun river and the Shatt al-Arab. It is reported that there are over 800 small to medium vessels (2,000 tons) and 70 large vessels (up to 20,000 tons) sunk. During the inspection of the bridge and port area, 11 large ships and over 100 small ships were observed, making the total reported losses appear reasonable.

504. The distance from Khorramshahr to the Persian Gulf is almost 100 kilometres and the whole length will require clearing and dredging. This in itself will be a massive operation costing hundreds of millions of dollars. It is reported that this cost has not been included in the cost estimates presented by the Government.

505. A list of large vessels reported sunk or damaged in the Shatt al-Arab and in the Persian Gulf was presented to the mission.

(b) Airports

506. Domestic air travel is provided by Iranian National Airlines (INA) which was incorporated in 1964, and the charter company, Aseman Airlines. In 1980 major international airports at Tehran, Bandar Abbas and Abadan were supplemented by 10 grade I and 11 grade II airports. INA served 15 cities in the Islamic Republic of Iran as well as scheduled services to the Persian Gulf, Far East and Europe. By 1988 INA had increased its domestic services to 38 cities.

507. In the border provinces there are major airports at Abadan, Ahwaz, Bakhtaran, Sanandaj, Urmiyeh and Tabriz. All received damage to some degree. In addition there was minor damage to Hamadan, Shiraz and Tehran airports but this has all been repaired and could not be verified. Damage to all airports was reported to be by aerial bombardment except in the case of Abadan, which also received artillery fire. The attacks were intermittent throughout the war.

508. The mission visited airports at Abadan, Ahwaz, Bakhtaran and Urmiyeh and the damage observed at these airports is described below. Photographs and plans were viewed of damage incurred at Sanandaj, Tabriz and Hamadan, which has all been repaired. As visits to these airports could not be arranged, the damage could not be inspected. However the reported damage was light, consisting mainly of minor cratering of runways and some blast damage to buildings. The areas of damage at Tehran airport were also inspected and confirmed to be minor. Damage plans of all airports that had suffered significant damage were presented to the mission.

Abadan

509. In 1980 Abadan airport operated as an international airport and was an alternate to Tehran. It was serviced by many Middle Eastern and European airways as well as the national carriers. Abadan has two asphalt runways,

2,380-metres-long (14L) and 3,280-metres-long (14R) respectively, and the longer runway was rated load class number (LCN) 75. Approach aids included a visual approach slope indicator system (VASIS), a very high frequency omnidirectional range finder (VOR), a non-directional beacon (NDB) and full ground lighting. Abadan has a two-storey main terminal with an attached tower and all basic facilities including fire fighting and meteorology suitable for a major airport.

510. During the war the airport was reportedly under continual bombardment and, owing to its proximity to Iraq it was closed to civilian traffic soon after war broke out.

511. The airport suffered moderate to severe damage but reconstruction has already begun and limited operations are expected to begin in late 1991. The airport was inspected by the mission and the damage was verified. There are many temporary patches of craters and shell holes on the runway, taxiway and apron. These areas have also suffered from water leaching into the subgrade, causing cracking in the asphalt surface. Resurfacing of the whole area will be required before the airport can be reopened and it is probable that some areas will need rehabilitation of the base.

512. Five medium-size civilian aircraft of Aseman Airlines were destroyed. These can still be seen close to the four main hangers, which also suffered serious damage. The fire-fighting and safety buildings were severely damaged and will need to be demolished. The control tower suffered moderate structural damage and it is reported that 60 per cent of the equipment was destroyed. As all equipment had been removed, this loss could not be verified.

513. The main terminal received moderate structural damage. Some damage to walls and beams was still apparent although much had been repaired. All equipment had been removed to allow repairs to be carried out to the structure. The main services and security buildings adjacent to the terminal have been completely destroyed as have the sanitary treatment plant and substation. There is moderate damage to the catering building and meteorological station.

514. Twenty houses for airport workers adjacent to the airport received moderate damage and 30 per cent of the boundary fence will require replacement. All the lighting systems were reported to have been destroyed, as were the VOR, NDB and other beacons. The airport did not have radar in 1980.

Ahwaz

515. Ahwaz airport is an important regional airport. With the closure of Abadan airport its importance increased. The airport was reportedly attacked 12 times from the air during the course of the war. Ahwaz has a single asphalt runway 3,580 metres in length with a rated strength of LCN 40. It has VASIS approach and full ground lighting, with an NDB navigational beacon.

516. The major severe damage was to the main two-storey terminal, which had been almost demolished and is now being reconstructed. Serious structural damage from bombs or shells is apparent in the parts of the building still remaining. The terminal had departure and arrival halls, a baggage handling area, a restaurant and administrative offices. The adjacent control tower suffered minor (25 per cent) structural damage but much of the equipment required replacement.

517. There were many temporarily repaired craters, noticeably on the runway, taxiways and aprons. About 1 kilometre of the 3.8-kilometre runway has been resurfaced, apparently because of the seriousness of the cratering. Some deep craters were still apparent adjacent to the runway in this area.

518. Damage to the water storage area was also evident, as well as to the fire-fighting buildings. Photographic evidence was produced to support damage sustained by eight houses used by airport workers (destroyed), one damaged and one destroyed civilian aircraft, 700 metres of boundary fence, one substation, a fuel store and the meteorological office.

519. Some development of the airport is being carried out in conjunction with the reconstruction, e.g. an additional runway is being built.

Bakhtaran

520. Bakhtaran airport is a medium sized regional class II airport built in 1972. It has one asphalt runway 2,850 metres long, (strength LCN 42), approach and ground lighting, ground control, VOR and NDB. The terminal building includes arrival/departure hall, baggage handling and other minor facilities. It has fire-fighting, medical and meteorology services. Between 1980-1988 the airport was reportedly attacked 13 times from the air with large and cluster bombs. Damage had been assessed at about 10 per cent structurally and 50 per cent to equipment.

521. The main damage was to the medical building (50 per cent), the telephone exchange (100 per cent), the lighting switch room (50 per cent) and the fire-fighting building (20 per cent). Although all damaged installations and equipment had been repaired, the work was consistent with the damage reported. Photographs taken at the time of the reported attacks were viewed by the mission.

522. It is reported that the runway was kept open throughout the war although the terminal building was closed for a number of years.

Urmiyeh

523. This class II airport is in the Azarbayjan Province and was a strategic location during the war. The airport has a single asphalt runway 1,000 metres long, rated LCN 74. It has a two-storey terminal and attached control tower and fire-fighting and meteorological services.

524. The airport was reportedly attacked many times during the war but damage was moderate. The apron was struck by three large bombs that destroyed a section of the apron and damaged a further 50 per cent of the area. Reportedly, there was 10 per cent damage to the main terminal from fragments, mainly broken windows, doors and minor cratering of exterior and interior walls. The meteorological office was reportedly completely destroyed, with its equipment, and the fire-fighting building and vehicles suffered 20 per cent damage. The western end of the runway was also reportedly damaged by bombs but was soon repaired.

525. The mission inspected all repaired areas and found these consistent with the damage reported. The airport did not cease operations and damaged areas have now been repaired except for some rehabilitation work which needs to be done to the apron.

Equipment

526. The equipment loss at airports falls into two categories, terminal and control tower equipment, and civilian aircraft loss. As noted above, it was reported that there was moderate loss of control equipment (radio, meteorological, passenger facilities, etc.) at Abadan and Ahwaz. The mission could not confirm the damage. However some repair and replacement was obvious. It is probable that much of the equipment from Abadan was removed when it was closed and used for replacement parts at other airfields. The mission verified the loss of the civilian plane at Abadan and the reported loss at Ahwaz. A list of losses was submitted by the authorities for record purposes.

(c) Meteorology

527. The Meteorology Organization comes under the responsibility of the Ministry of Roads and Transport. It maintains over 70 meteorological stations throughout the country. During the conflict many were damaged. Two such stations, Dehloran and Bakhtaran, were visited by the mission. The Dehloran station reportedly was completely destroyed during its occupation by Iraqi forces. On inspection the mission found new buildings, indicating that the station had recently been reconstructed. The station at Bakhtaran airport suffered minor structural damage and this has now been repaired. However, it sustained a reported 30 per cent loss of equipment.

528. A summary of damaged stations, presented by the Iranian authorities, is shown in map 13. Additional details of these stations were presented to the mission.

Map 13

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(d) Rail transport

529. In 1980 there was a total of only 4,570 kilometres of single track line and Iranian Railways carried 5 million passengers and 5.7 million tons of freight. In 1988 at the end of the war the track length had increased to 4,834 kilometres, with 6.8 million passengers carried and 8 million tons of freight, although the track from Ahwaz to Khorramshahr was out of commission for part of the period.

530. The major damage to rail track is in Khuzestan Province, in particular to the Ahwaz-Khorramshahr line. This 120-kilometre single track line and associated signalling equipment and small switching halts was said to have been almost entirely destroyed during the ground war. The track has been completely rebuilt, including earthworks' reconstruction. There was evidence of this rebuilding in the 40 kilometres inspected close to Khorramshahr, but it is unlikely that the sections close to Ahwaz required complete reconstruction. The reconstruction work carried out is of a temporary nature. Five or six rail bridges/culverts were reported to have been damaged and replaced on this section of line. The mission inspected two of these and found that, while they were obviously new, the reason for replacement could not be confirmed. During the period that Khorramshahr was occupied this line was closed.

531. The mission noted that most damage was caused to railway stations and marshalling yards and five major bridges. At a number of small stations, trains were attacked whilst standing and this resulted in associated minor to moderate damage to the station buildings and track. The stations in this class inspected include Hoseyniyeh and Hamid on the Khorramshahr line, SarBandar on the Bandar Emam Khomeyni line, Haft Tappeh on the Andimeshk-Ahwaz line and Tolezang on the Dorud-Andimeshk line. The reported damage to small stations has been listed and is on file. Damage to the rail network is set out in map 14.

Map 14

MAP NO. 3642.5 UNITED NATIONS
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Ahwaz

532. This station is a junction on the main Tehran-Khorramshahr, Tehran-Bandar Emam Khomeyni lines and has extensive marshalling yards, locomotive sheds and workshops and freight storage areas. In 1980 there were a reported 5 passenger and 10 (900-ton) freight trains each day. The freight trains were combined at Ahwaz to allow 2,000-ton loads for the flatter rail sections to the ports.

533. It was reported that the station was attacked by air 38 times during the war and also suffered some artillery fire in the early stages of the conflict. Moderate damage was reported to the main terminal (10 per cent), the stores and offices (20 per cent), signal control building and equipment (20 per cent), a pedestrian bridge (50 metres), the track roof at the passenger station (150 metres), locomotive sheds (10 per cent) and overhead crane, some small storage buildings (100 per cent), the station walls (20 per cent) and extensive damage to track and rolling stock.

534. An inspection of the area confirmed rebuilding consistent with the damage reported as well as debris and destroyed equipment. Photos of the damaged areas were viewed and these were also consistent with reported damage.

535. The station is at present 80 per cent operable, although some of the reconstruction is of a temporary nature. Additional reconstruction is required in the locomotive sheds and to the signalling equipment.

Khorramshahr

536. Khorramshahr station was the terminal station on the main Tehran line and served Khorramshahr port. In 1980 it had an average of five passenger and three (2,000-ton) freight trains a day. The station complex covered 0.6 square kilometres and included station and baggage buildings, marshalling yards, repair and cleaning sheds, covered areas, warehouses and fuel and water loading areas.

537. The station was completely destroyed, as were all the track and control systems in the station area. The destruction is still apparent. It was reported that 647 wagons and 5 locomotives were destroyed; many of these can still be seen in the station area. The destruction reportedly occurred both during and after the city was occupied; some rebuilding was said to have been attempted but this was also destroyed. It is proposed to rebuild the station complex 300 metres up-line from the destroyed station.

538. Up to 100 houses of railway workers adjacent to the station were also reported destroyed.

Andimeshk

539. This station is on the Tehran-Ahwaz line, about 140 kilometres from Ahwaz at the foot of the mountains. It is a large terminal and in 1980 handled an average of six passenger trains and 15 freight trains (averaging 900 tons)

each day. The station has marshalling yards, a workshop, locomotive repair sheds and baggage storage buildings in addition to the main passenger terminal building.

540. The station area suffered many air attacks during the war including a large attack in 1986. The principal damage reported was to rolling stock (80 wagons and 3 locomotives). In addition light-to-moderate damage was inflicted on marshalling yard tracks, buildings, the electrical substation and the water tower. All damage was repaired during the war, some temporarily.

541. An inspection of the station confirmed that repairs had been carried out and that these were consistent with the reported structural damage.

Railway bridges

542. Seven major railway bridges were reported damaged or destroyed, all by aerial bombardment. Four were inspected by the mission, and photos taken by the Iranian authorities at the time of the damage were also viewed. In all cases the pattern of reconstruction was consistent with the damage reports and photos. All bridges had been temporarily repaired at the time of the visits by the mission.

543. The main Ahwaz rail bridge over the Karun river is 450 metres long and has a steel arch superstructure on concrete piers and footings. It was reported damaged in two attacks. On the eastern side a pier had been damaged and on the western side a steel arch and deck span destroyed. Debris and deformed steel members were noted at the site.

544. Two bridges on the Andimeshk-Dorud line were reported seriously damaged. The Tolezang bridge is a 448-metre-long stone arch bridge with a depth of 27 metres. The main span is 72 metres. It was reportedly attacked many times and reconstructed three times. The most serious damage was the destruction of the main arch and two subsidiary arches. Repair work and photographs tended to confirm this damage.

545. The rail bridge at Souili, built in 1934, is of similar construction with a 35-metre main span. It was reported that two subsidiary arches were destroyed and there was damage to the main span and arch. Reconstruction work tended to confirm the report.

546. The important rail bridge at Qotoc near the Turkish border on the Tabriz-Van line was also reported damaged and was visited by the mission. It is economically important as its destruction would halt the flow of goods by rail into and out of Turkey. The bridge is a high-level steel arch with concrete piers and buttresses and steel columns to a steel deck. It has an overall length of 440 metres with a main arch span of 220 metres. The deck is 130 metres above river level. The prestressed concrete main piers rest on reinforced concrete piles that are driven to a depth of 20 metres.

547. The bridge was reportedly attacked frequently and in 1985 both main buttresses and piers were badly damaged and 40 metres of deck was destroyed as well as a steel column. Minor damage was done to other deck members and subsidiary piers. The bridge was closed for three months whilst temporary deck repairs were carried out (steel truss and plate deck); trains crossed the bridge by winching one wagon at a time.

548. The mission observed that repairs to the main piers, which began in 1989, were still being carried out by filling the damaged prestressed box piers with shotcrete, stripping away the prestressed walls and replacing them. Because of the extent of the damage it is intended to replace the whole deck. Repairs will not be completed for another four years. Damage to the bridge from rocket fire is still obvious as repairs are only partially complete. In order to maintain traffic whilst the deck is being renewed an 8-km diversion track is being laid to a low-level bridge. As this has grades of 3 per cent it would not be suitable for permanent use. The alternate route was inspected and is of a good standard and has required heavy earthwork. In 1980 the bridge carried six to seven trains a day and the bridge was rated for 1,000-ton load. At the present time one train a day can use the bridge with a maximum of 300 tons.

549. Damage to other major rail bridges was reported to have occurred at Sakone Lashkar (50 per cent), Keshvar (5 per cent) and Puldukhtar (10 per cent). These were not visited by the mission and the reported damage could therefore not be confirmed.

Equipment

550. Rail equipment has been estimated by the Iranian authorities as one of the major losses in the transport sector, being exceeded only by shipping losses. The major losses are reportedly in rolling stock, locomotives, passenger and freight cars. Destroyed rolling stock was evident at Khorramshahr station and photographic evidence of other losses was shown to the mission by the Iranian authorities. A list of reported equipment and rolling stock losses was presented to the mission for record purposes.

(e) Roads

551. Roads are by far the most important of the transport subsectors, with main highways connecting Tehran with the provincial capitals, each of which is a hub for the surrounding road network. Although road construction did not seriously supplement the rail network until the 1970s, by 1980 there were 160,000 kilometres of all-weather roads, of which 42 per cent was fully paved. At that time there were over 1 million automobiles, most of which were in Tehran, and nearly half a million trucks and buses. The roads carry the bulk of all freight and passenger movements into and around the country.

552. Extensive damage to roads was evident in all border areas, particularly in sectors where ground warfare and occupation had taken place. Damage in

Bakhtaran, as well as in Ilam and Khuzestan, was particularly severe and widespread, caused mainly by bombardment and from abnormal loads, especially tanks.

553. Damage to major bridges is detailed separately. However, the mission observed that extensive damage was also caused to small bridges (under 10 metres) and drainage culverts, many having been completely destroyed or damaged. In other cases culverts and bridges were blocked for defensive reasons and large-scale clearance and maintenance are required to return them to their original use.

554. It was evident to the mission that most of the roads in these provinces had not received normal routine maintenance during the conflict and that this had accelerated the deterioration of the road surface and structure.

555. The authorities stated that many of the roads had been surfaced in 1985-1986 because of damage by overweight vehicles, and the same damage is again apparent. The heavy military traffic, followed since the cease-fire by reconstruction vehicles, has damaged the basic structure of the roads. Even allowing for the fact that under normal circumstances a bituminous asphalt resurface would have been due, there is no doubt that the road network suffered extensive damage during the war over and above normal wear and tear.

556. Roads in the cities and towns close to the border also suffered considerable damage, and in many cases reconstruction is in process. In Khorramshahr many roads were found to have been covered in debris, and further damage appeared to have been done during the clearing process. It is estimated that 80 per cent of all streets in Khorramshahr and 40 per cent in Abadan require rehabilitation and resurfacing because of war damage and lack of maintenance.

557. The damage to road drainage in the cities and towns could not be ascertained but years of neglect will have caused many problems requiring replacement of pipes.

558. There was extensive damage reported to minor bridges from overweight vehicles on all roads. The mission inspected 12 such bridges. Whilst it was apparent that all have either been rebuilt, repaired or reconstructed, the reason for the replacement could not always be verified. In most cases however the debris of the old bridge or culvert was evident and indicated structural failure not associated with normal wear and tear.

559. It has been estimated by the Iranian authorities that, of the total damage suffered by the transportation sector as a whole, only 8 per cent was road- and bridge-related damage. Of this 21 per cent was damage to installations and 79 per cent loss of equipment; the high percentage for equipment is due to the foreign exchange component. The mission considered however that the percentage estimated for road and bridge damage is too low when compared to damage assessed in the other transport subsectors. The authorities may not have appreciated the degree of rehabilitation work required on the lower layers of the roads to return them to pre-war conditions.

Map 15

MAP NO. 3642.4 UNITED NATIONS
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560. Although there has been little damage to roads and bridges outside the border provinces, there has been a deterioration in their structures owing to indirect war-related causes. A large amount of road construction and maintenance equipment was sent to the border provinces during the war not only for military purposes (constructing bunds and revetments), but to repair damaged roads and bridges and to replace destroyed equipment in these areas. This meant a reduction in essential maintenance equipment in other provinces, with a consequent reduction in essential road maintenance leading to accelerated deterioration.

Khuzestan

561. The mission inspected the following major paved roads in Khuzestan Province:

Ahwaz-Khorramshahr-Abadan (140 kilometres)

Abadan-Bandar Emam (first 40 kilometres)

Ahwaz-Andimeshk (120 kilometres)

Ahwaz-Bostan (90 kilometres)

Bostan-Howeyzeh (30 kilometres)

Andimeshk-Dehloran (130 kilometres)

562. Most of the roads had been reportedly resealed in the last five years because of rutting and cratering. This was evident in sections not recently resurfaced and, particularly, those that had been crossed and recrossed by military vehicles such as the Ahwaz-Bostan and the Andimeshk-Dehloran network.

563. It was reported that over 500 kilometres of roads in the province required resurfacing because of war damage. It was the mission's opinion that this was a conservative estimate and that in many cases rehabilitation of the subgrade and base would be required.

Ilam

564. The mission inspected the following major and minor paved roads in Ilam Province:

Dehloran-Mehran (130 kilometres)

Mehran-Saleh Abad (65 kilometres)

Saleh Abad-Ilam (35 kilometres)

565. All these roads had been in the front line of fighting in the early and latter stages of the war. The roads are in undulating to hilly terrain and, although reportedly sealed in 1985, show serious signs of distress. In many places the resurfacing had failed to repair the underlying failure. In particular the 195 kilometres from Dehloran to Mehran to Saleh Abad appeared to have suffered damage from bombardment in addition to rutting and cracking because of heavy traffic, causing extensive damage to the base and subgrade.

566. It is reported that as much as 80 per cent of the paved road in the province suffered damage because of the war. The mission considers this figure overstated. However, including minor paved roads, as much as 400 kilometres could have suffered some damage.

Bakhtaran

567. The mission inspected the following major and minor paved roads in Bakhtaran Province:

Chenel Zari-Sumar (45 kilometres)

Sumar-Naftshahr (25 kilometres)

Naftshahr-Qasr-e-Shirin (70 kilometres)

Qasr-e-Shirin-Khosravi (15 kilometres)

Qasr-e-Shirin-Sar-e-Pol-e-Zahab (30 kilometres)

Sar-e-Pol-e-Zahab-Emam Abbas (30 kilometres)

Sar-e-Pol-e-Zahab-Guilan-e-Gharb (50 kilometres)

Sar-e-Pol-e-Zahab-Islamabad (75 kilometres)

568. These were some of the worst roads inspected and many of them will require complete reconstruction, especially those in the border strip that was occupied for most of the war. The road from Sumar to Naftshahr to Qasr-e-Shirin is completely destroyed. What was in 1980 a minor paved road is now a very rough cratered earth track, with all bridges and culverts destroyed or irreparably damaged. It is estimated by the mission that at least 150 kilometres of previously sealed road will require complete reconstruction, with extensive rehabilitation to a further 100 kilometres. The fact that as many as 100 kilometres of these roads run through partially cleared minefields will add to the cost and danger of reconstruction.

Other provinces

569. The mission did not visit roads damaged in other border provinces. These were reported to be of lesser importance in terms of damage sustained.

Equipment loss

570. It was not possible to inspect much of the destroyed equipment during the site visits, as this had already been cleared from road sites and depots. A list of road equipment damaged and destroyed in various provinces was presented by the authorities to the mission for record purposes. The list includes equipment sent from other provinces to the border area for defence purposes as well as for road repair.

(f) Bridges

571. On all roads inspected in the main theatres of war, there was evidence of extensive damage having been inflicted on bridges. Many bridges were reportedly repaired during the war, only to be damaged or destroyed again. In many cases, destroyed spans were still in the river and temporary repairs were clear. Where possible Bailey bridging or steel plates had been used to bridge the damage but in many cases more extensive reconstruction needed to be undertaken.

572. Most bridges in the region are of basic design, simply supported spans, steel or stone arch or steel truss, on stone or concrete piers. Whilst the majority of bridges in Khuzestan were piled bridges, in the more mountainous rockier provinces of Ilam and Bakhtaran they were constructed with concrete or stone footings. The basic design of the bridges made it possible for repair and reconstruction work, albeit of a temporary nature, to be undertaken with limited local materials. However, most bridges inspected will eventually need more permanent repair or replacement.

573. The mission inspected a total of 40 major bridges (over 20 metres). A summarized list of those bridges inspected is on file for future reference.

Khuzestan Province

Khorramshahr

574. The Khorramshahr bridge across the Karun river was reported to have been severely damaged by air and land bombardment. The reinforced concrete piled bridge is 414 metres long with a width of 11.75 metres (four lanes). There are 10 approach spans of 22 metres on either side with 6 main spans.

575. The bridge is being almost totally rebuilt. Only two of the main piers are being retained and repaired and there is to be a new superstructure. Heavy shell damage was apparent to the remaining parts of the existing bridge and photographs were presented showing the damage to those sections that had now been replaced.

Abadan

576. Abadan is an island: on one side is the Shatt al-Arab waterway and on the other the Karun river. Three major bridges connect the Abadan Island to the Iranian mainland. One is the Khorramshahr bridge (described above) and the other two (described below) are close to Abadan itself.

577. The first had been built as a two-lane 180-metre bridge leading to the Abadan-Ahwaz and Abadan-Emam Khomeyni road. The bridge had a steel bored pile foundation with a steel girder and deck superstructure and was bitumen surfaced. The bridge was said to have been damaged by air attack and three spans destroyed. It is now being used only as a footbridge but it is proposed to construct a new bridge 3 kilometres upstream, as the damaged structure is irreparable. Meanwhile, a temporary pontoon bridge and access road has been constructed downstream.

578. The second bridge was on the Abadan bypass-Khorramshahr road (12 kilometres). This bridge had reinforced concrete piers, T-beams and deck and consisted of 6 spans with a total length of 200 metres. The bridge carries three lanes of traffic. It was reported that the bridge had been attacked three times and repaired three times. One span had obviously been replaced with steel girders and composite deck. Parts of the old deck were visible in the river.

Ahwaz - Big bridge

579. This 500-metre bridge spans the Karun river. It is a triple steel arch bridge on stone foundations. It was reportedly bombed twice, causing minor damage to the western abutment and deck and moderate damage to the eastern deck. The damage is obvious and temporary repair has been made with steel plates to bridge the holes in the deck. Permanent repair will not present much difficulty.

Bostan Town bridge

580. This bridge was reportedly destroyed by explosive charges and the damage observed would tend to confirm this. The bridge was a steel truss and steel deck with a span of 90 metres. The truss had been blown at both ends so that the deck collapsed. The bridge was repaired using parts of the destroyed truss and many of the truss members are deformed. It is proposed to replace the truss and deck.

Djesr Naderi bridge

581. This bridge is on the Andimeshk-Dehloran road and spans the Karkheh river. It was a six-span simply supported composite deck (steel beam, concrete deck) on reinforced concrete piers-piles with a total length of 100 metres. The bridge was reportedly bombed in 1986. When inspected, the main 45-metre span was lying in the river and Bailey bridging provided temporary access. A new bridge of similar design is being constructed 50 metres downstream.

Ilam Province

Changuleh bridge

582. This bridge is situated on the Dehloran-Mehran road in Ilam Province and spans the Changuleh river. It has pile foundations with concrete piers and a simply supported composite steel beam and concrete deck. There are 3 spans and the total length of the bridge is 120 metres. The height above the water level is 20 metres.

583. The bridge has been completely destroyed, reportedly both by aerial bombardment and, in 1988, by ground explosions. The debris of the old bridge is still apparent. A temporary replacement has been constructed with a steel truss-deck on concrete footings but a completely new bridge will be required.

Zagavi bridge

584. This bridge is also on the Dehloran-Mehran road and is a 3-span composite steel beam concrete deck on stone piers and footings with a total length of 60 metres. It was reportedly blown up by ground explosive in 1988. Debris from the old deck is evident in the river, although some of the deformed steel beams and plate have been used in the temporary deck. The piers suffered minor damage and have been repaired. The mission was informed that the authorities intended to construct a new deck on the old piers.

Kondjancham 1, 2, 3

585. On the Mehran-Saleh Abad road there are three major bridges over the Kangacham river. All three were reportedly damaged from aerial bombardment and then destroyed by explosives in 1988.

586. The bridges are 45-metre 3-span, 50-metre 6-span and 30-metre 5-span bridges respectively and all were simply supported reinforced concrete slab decks on stone piers and footings. All decks and most of the piers have been destroyed and debris is still evident in the river at all sites. At present a temporary road deviation bypasses two bridges and the third is a temporary steel beam and deck on repaired piers. It is intended to replace all with reinforced concrete or composite decks on rebuilt concrete piers and footings.

587. Most bridges on roads in the border area of the province had suffered severe damage. The mission inspected a further three major bridges on the Dehloran-Mehran road.

Bakhtaran Province

Haftdhaneh bridge

588. The Haftdhaneh seven-arch bridge is on the Chenel Zari-Sumar road in Bakhtaran Province. It is, as its name suggests, a stone 7-arch bridge on footings with a total span of 70 metres. Two spans have been destroyed,

reportedly from aerial bombardment. Temporary repairs in steel have been made but the bridge requires extensive reconstruction.

Naftshahr bridge

589. The bridge at the entrance to the town of Naftshahr has, like the rest of the town, been completely destroyed. It was a 4-span reinforced concrete bridge on footings with a total length of 40 metres. Debris from the old bridge is apparent in the river. It is intended to rebuild the bridge completely with a similar structure.

Tangab bridge

590. This bridge is on the Naftshahr-Qasr-e-Shirin road and spans the Tangab river. It had a 7-span reinforced concrete deck, pier and footings with a total length of 70 metres. It was reportedly damaged by aerial bombardment and replaced with a steel deck but then blown up in 1988. The bridge is now totally destroyed with only three damaged piers standing. A seven-cell box culvert with no deck is being used as a very temporary replacement. Most vehicles prefer to ford the river when conditions permit.

591. Work has started on a new reinforced concrete bridge of similar design to the original.

Emam Abbas

Emam Abbas bridge

592. This bridge on the Sar-e-Pol-e-Zahab-Emam Abbas road is a 5-span concrete slab deck on stone piers and footings with a total length of 50 metres and a height of 5 metres above water level. It was reportedly blown up and two spans were destroyed. Bailey bridging is presently used to span the destroyed deck. It is intended to replace the complete deck as the remaining spans have structural damage.

593. On the border roads in the province all bridges were damaged and most destroyed. The mission viewed a further eight major bridges in the province, and briefly inspected by air many of the 20-metre and under span bridges on the Naftshahr-Qasr-e-Shirin-Khosravi roads, all of which had been completely destroyed.

(g) Transport terminals and depots

594. Few transport terminals in the border region were reported to have suffered damage and none were inspected. Damage was suffered by some district road offices and loss of equipment, buildings (and life) was reported.

595. In Khuzestan four offices were inspected. The district office at Abadan was reported to have been bombed three times. Although the area had been mainly cleared and partially rebuilt, there were still some skeletons of

workshops and stores. The main offices were also reported destroyed. The roads office at Susan-Guerd was reportedly occupied by enemy forces for a period of time and almost totally destroyed in the process. It has now been rebuilt, and this is evident from the new structures. The two-storey office at Ahwaz is situated close to the railway and reportedly suffered air attacks. Moderate structural repair could be seen. The compound still bore evidence of craters and debris. The roads office at Dehloran was reported destroyed twice by aerial bombardment and completely rebuilt. The new structure was evident.

596. In Bakhtaran Province the roads offices at Naftshahr and Qasr-e-Shirin were completely destroyed, as was the rest of the two towns. The maintenance office at Mershad was also destroyed, reportedly by bombardment; the ruins were evident. Other roads depots reportedly suffered damage but no details were available.

(h) Reconstruction in the transport sector

597. An impressive amount of reconstruction has already been carried out in the transport sector both during the war and since 1989. As stated previously it was essential for the war effort to keep transport corridors open in the border provinces therefore reconstruction of roads, bridges, rail and airports commanded high priority. Much of this reconstruction was however done under war conditions and with local or salvaged material. It was, for instance reported that a substantial amount of bridge reconstruction was done at night with little artificial light. The consequence of this is that most of the reconstruction carried out to date in this sector is temporary. Reconstruction of roads damaged by shell fire or overloaded vehicles, for instance, was effected by applying an asphalt overlay as a temporary measure. In many cases reconstruction of the lower layers is required for a permanent solution. Plans are in hand in some of the transport subsectors for more permanent reconstruction.

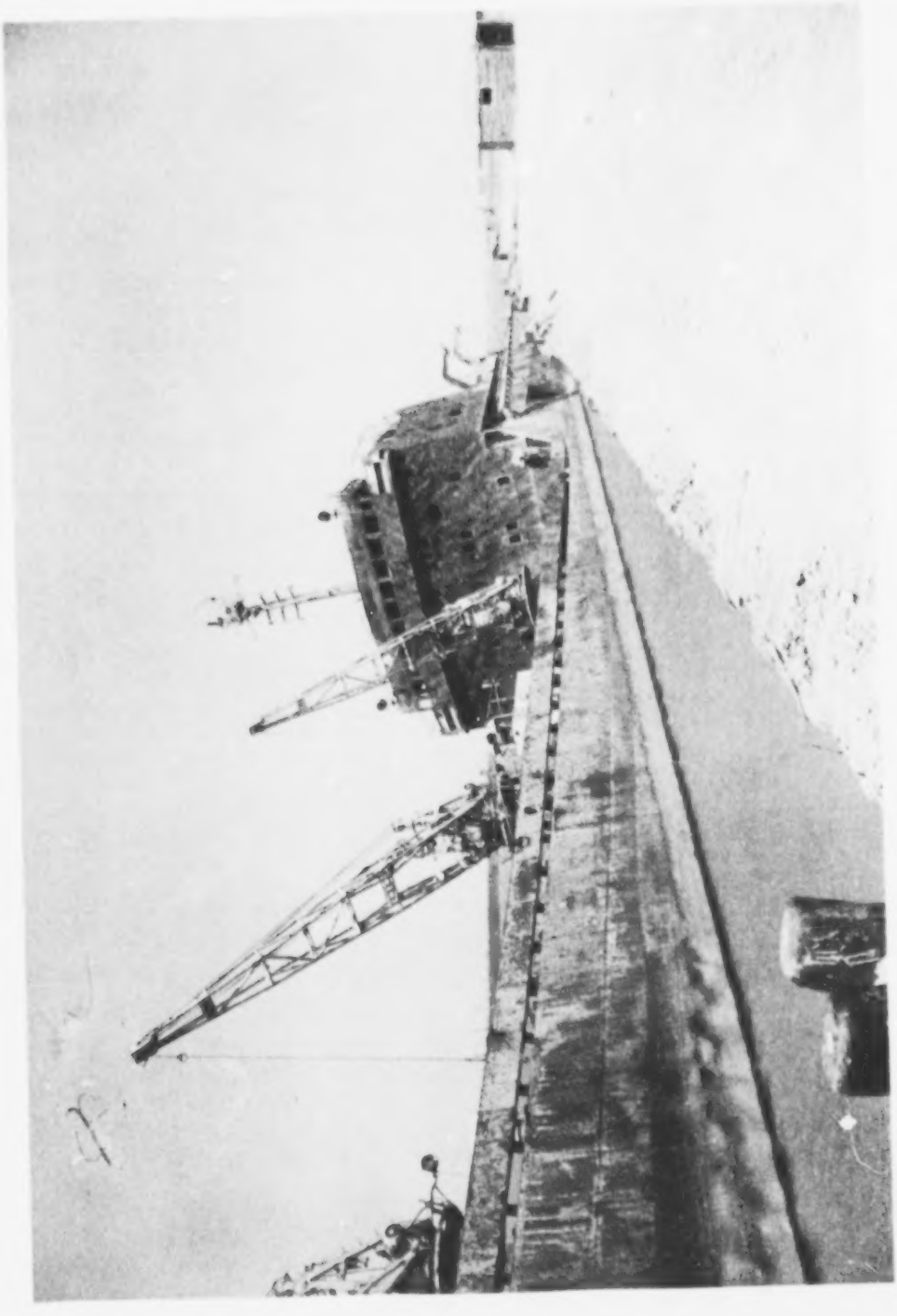
598. It was not possible to obtain an official priority list for reconstruction in the transport sector but the rebuilding of Khorramshahr and Abadan ports was said to be high on the list. Such work, however, will have to be preceded by the clearing of the Shatt al-Arab waterway, itself an enormous task.

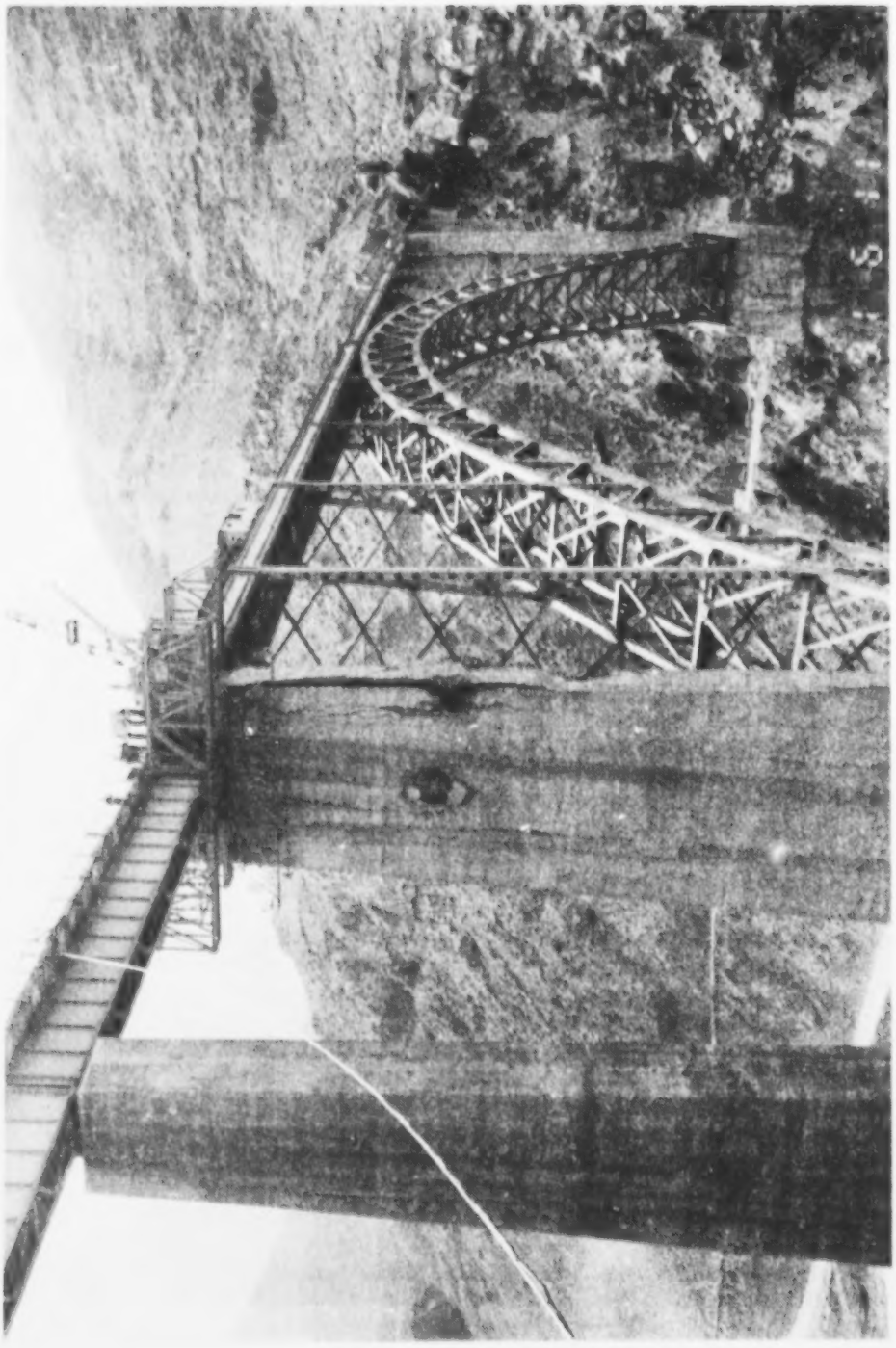
599. In the roads subsector a medium-term plan to rehabilitate many sections of road is required, followed by systematic resurfacing. A great deal of repair to road drainage, shoulders, road markings and signs is also required. Similarly a medium- to long-term plan for the permanent repair and replacement of all damaged and destroyed bridges is needed, which will require a significant foreign currency component for materials not locally produced.

600. The rail subsector has as its priority the rebuilding of Khorramshahr station and the rehabilitation of the Ahwaz-Khorramshahr section of track. The permanent repairs to the Qotoc bridge are already in progress and repairs to other structures are either complete or can be given lesser priority.

601. In the air subsector, except for Abadan airport, most damage has been minor and repairs already carried out will be adequate, except for some runway and taxiway resurfacing. Repairs to Abadan are considered a high priority and are already in progress.

602. A large amount of machinery and plant was reportedly lost or destroyed in all transport subsectors and this will have to be replaced to allow operations and maintenance to return to normal. The cost of this replacement has been estimated by the Iranian authorities as greater than the cost of repair and rehabilitation of installations and structures. This replacement will require a substantial foreign currency component as most of the equipment is not manufactured in the Islamic Republic of Iran.





G. Other sectors

603. In the course of meetings with government representatives, the mission was informed of the extensive losses inflicted on the health and education infrastructure, as well as on cultural sites and historic monuments. As the mission did not comprise members with the necessary expertise in these sectors, it arranged to collect available data and information from the authorities concerned with a view to a more in-depth examination being undertaken at a later stage.

1. Health

604. The Government reported that, within the five border provinces, the war resulted in the damage to or destruction of 5 hospitals, 102 health clinics and 107 rural and urban health centres. Table 14 gives a detailed breakdown of the location and type of health facility destroyed.

605. In addition to the loss of physical facilities, the war has had an adverse impact on the level and standard of health services owing to the exodus of medical personnel from the region. Prior to the war, some provinces boasted 1 physician to every 2,000 to 3,000 persons. Today, the ratio is not more than 1 physician per 10,000 people. In addition, there is a severe shortage of nurses and other specialized medical personnel as well as an acute shortage of medical and laboratory equipment. Moreover, increasing calls are being made on the health authorities to deal with people who have been traumatized by the war and who require both short- and long-term rehabilitation programmes. This is particularly the case with children, many of whom have suffered emotional shock from having been subjected to violence, stress and anxiety generated by the war. The authorities expressed the wish for international assistance in coping with this human tragedy.

Table 14. Health facilities destroyed

City	Hospital	Health clinic	Rural health centre	Urban health centre	Health supply station	Rural health training station
West Azarbayjan Province						
Urmiyeh	-	-	2	3	-	-
Piranshahr	-	-	1	-	1	-
Mahabad	-	1	1	-	-	-
Sardasht	-	-	3	1	-	-
Miyandoab	-	-	2	1	-	-
Kordestan Province						
Baneh	-	-	3	1	1	-
Marivan	-	4	5	1	1	-
Saqqez	-	-	5	2	-	-
Sanandaj	-	6	6	2	-	-
Qorveh	-	-	-	-	-	-
Bijar	-	-	1	-	-	-
Bakhtaran Province						
Paveh	-	-	2	1	-	-
Qasr-e-Shirin	1	-	4	1	1	-
Sar-e-Pol-e-Zahab	-	-	3	1	-	-
Guilan-e-Gharb	-	-	-	1	-	-
Javanrud	-	-	1	-	-	-

Table 14 (continued)

City	Hospital	Health clinic	Rural health centre	Urban health centre	Health supply station	Rural health training station
Ilam Province						
Dehloran	-	12	5	3	1	1
Darreh Shahr	-	-	1	3	-	-
Ilam	-	7	4	5	-	1
Mehran	-	10	2	2	1	1
Khuzestan Province						
Abadan	2	25	6	10	1	1
Khorramshahr	2	-	2	12	1	-
Dasht-e-Azadegan	-	30	3	3	1	1
Mahshahr	-	-	1	1	-	-
Dezful and Shush	-	7	2	1	1	-
Ahwaz	-	-	-	1	-	-
Shushtar	-	-	-	-	-	1

2. Education

606. The Government provided the mission with a statistical account of the losses suffered in the education sector. Before the war there were about 30,000 educational institutions in the entire country. Of these, about 3,000 were damaged (2,120 elementary schools, 440 secondary schools, 350 high schools, 12 technical schools, 8 units for higher education for the Ministry of Education, 8 sports-schools and 8 administrative buildings). At the time of the mission's visit, 1,420 had been reconstructed and were in use.

607. Besides the physical damage to the educational infrastructure, large numbers of students had moved to the provinces for safety, while a considerable number of students and teachers were killed during attacks.

608. The population displacement engendered by the war affected schools in other parts of the country beyond the immediate area of conflict. The situation necessitated increased enrolment involving additional shifts each day in order to accommodate all students. Supplying schools with sufficient teaching materials posed another problem. The shortage of paper resulting from the damage to paper factories has made textbooks scarce.

609. In the reconstruction considerable attention is being given to vocational training, since this type of training will contribute directly to the reconstruction effort. Present policy requires each high-school graduate to have some technical training. The high-school curriculum is being changed and new high schools are being built with technical units attached to them.

610. A team of experts from the United Nations Educational, Scientific and Cultural Organization (UNESCO) visited the Islamic Republic of Iran in May 1990 and held meetings with government representatives on possible cooperation in the light of the reconstruction needs and within UNESCO's area of competence. In the education field, the UNESCO mission was informed of the extent of damage and other losses resulting from the war and noted the Iranian authorities' interest, among other matters, in cooperating with UNESCO in the reconstruction of schools and other educational facilities and in the education of the handicapped (including the war disabled). Besides reconstruction, the Government also expressed interest in developing its educational programmes further.

3. Cultural heritage

611. The Government was very much concerned by the damage that had been caused to historical monuments and sites, some of which date back to the Median civilization. It was stated that they had either been damaged or their structures severely weakened as a result of aerial attack or artillery fire. In addition to historical sites in the border provinces, air and missile attacks caused major damage in other provinces.

612. In Esfahan, the mission visited a number of damaged sites and monuments. It observed that considerable repair and restoration work had already been completed and that repair work was under way on a number of other sites.

613. The mission met with the Director of the Cultural Heritage Organization and was given a list detailing the locality, level of damage and time required for work to be completed on the principal historical sites and monuments. This information is set out in table 15.

614. A UNESCO mission held meetings with the authorities on matters relating to the protection and preservation of the country's cultural heritage. The UNESCO mission reportedly was informed of the extent of damage that had been caused to cultural monuments and documents as a result of the conflict and discussed with the Government potential areas of cooperation for their restoration. Proposed action included: assistance in the creation of a laboratory for the restoration of cultural property; training of specialized personnel in the restoration of cultural and historical monuments; and a technical study for a mobile laboratory for micro-filming and restoring manuscripts.

615. The Government informed the United Nations team of its continued interest in the proposed UNESCO projects.

Table 15. Damage to historical monuments and sites

City	Name of historical monument/site	Approximate extent of damage (percentage)	Time required for restoration (years)
Abadan	Abadan Museum	100	4
Hamadiyeh-Ahwaz	Hamidiyeh mounds	35	-
Shush	Archaeological station museum	30	10
Shush	Prophet Daniel's Tomb	40	5
Shush	Ancient Shush mounds	15	-
Shush	Apadana Stone	40	3
Shush	Jaafarabad mounds	25	-
Shush	Jovi mounds	20	-
Shush	Chogha-Zanbil	20	4
Shushtar	Friday Mosque	-	-
Dezful	Ancient site	50	7
Dezful	Friday Mosque	50	-
Dezful	Molla Alishah Mosque	100	-
Behind Gas station	Ancient mounds	15	-
Haft Tappeh	Bandbal mounds	-	-
Haft Tappeh	Buhlan mounds	-	-
Ahwaz-Haft Tappeh road junction	Khansar mounds	20	-
Haft Tappeh	Haft Tappeh mounds	25	-
Haft Tappeh	Archaeological station	90	3
Haft Tappeh	Haft Tappeh museum building	-	3

Table 15 (continued)

City	Name of historical monument/site	Approximate extent of damage (percentage)	Time required for restoration (years)
Haft Tappeh	Ahufandva mounds	25	-
Andimeshk	Karkheh Palace	95	4
Qasr-e-Shirin	Qasr-e-Shirin	100	-
Bakhtaran	Historical centre of Bakhtaran	25	3
Esfahan	Esfahan Friday Mosque	15	1
Esfahan	Araban bazaar	40	1
Hamadan	Hagestaneh mounds	-	1
Hamadan	Ghorban tower	-	-
Esfahan	Historical/cultural centre	10	-
Esfahan	Agha Nur Mosque and Dardasht bazaar	10	-
Esfahan	Haj Rahim Khan Mosque and adjacent residences	5	-
Esfahan	Haj Mohammad Jaafar Abadehi Mosque and adjacent bazaar	5	-
Esfahan	Seyyed Mosque and adjacent residences	5	-
Esfahan	Sheikh-al-Islam residence	30	-
Esfahan	Kharrazi residence	40	-
Esfahan	David residence	20	-
Esfahan	Sukiyans residence	20	-
Esfahan	Haghighi residence	15	-
Esfahan	Amini residence	50	-

Table 15 (continued)

City	Name of historical monument/site	Approximate extent of damage (percentage)	Time required for restoration (years)
Esfahan	More than 20 ancient residences in the historical centre	100	-
Esfahan	Chehel Sotun Palace	20	-
Esfahan	Ali Qapu Palace	15	-
Esfahan	Sheikh Lutfullah Mosque	10	-
Esfahan	Imam Mosque	10	-
Bakhtaran	Friday Mosque	10	-
Bakhtaran	Tekeyeh-e-Moaven-ul-Mulk	10	-
Bakhtaran	Tekeyeh-e-Beiglarbeigi	10	-
Qum	Bazaar	10	-
Zanjan	Bazaar	10	-
Arak	Sepahdar bazaar and theological college	20	-
Burujerd	Friday Mosque	30	-
Burujerd	Imam (Soltani) Mosque	5	-
Khorramabad	Falak-u-Aflak Palace and museum	25	-
Khorramabad	Dokhtar bridge	5	-
Khorramabad	Shekasteh bridge	5	-
Urumieh	Bazaar	10	-
Tehran	Fabric of ancient bazaar	30	-
Tehran	Imam Jomeh residence	60	-

Table 15 (continued)

City	Name of historical monument/site	Approximate extent of damage (percentage)	Time required for restoration (years)
Tehran	Iran Bastan museum	25	-
Tehran	Golestan Palace and museum	10	-
Tehran	National Arts and Decorative Arts Museums	25	-
Kashan	Ancient fabric (centre)	5	-
Nahavand	Friday Mosque	25	-
Ilam	Vali fort	50	-
Sanandaj	Dar-al-Ehsan Mosque	5	-

III. CONCLUDING REMARKS

616. In order to address the question of reconstruction, it is necessary to first establish the nature and extent of damage that needs to be addressed. The purpose of this exploratory mission was therefore directed towards surveying the nature and extent of damage, verifying - to the degree possible - information provided by the Government through on-site inspection.

617. Based on this initial survey the mission has concluded that reconstruction of the physical infrastructure damaged or destroyed in the Islamic Republic of Iran during the conflict will be a costly and lengthy process. As the war was fought for the most part on Iranian territory, the consequences to the population, the economy and the environment are enormous.

618. The Government's reconstruction programme is based on the urgent need to return the country to normal life as soon as possible, revitalize the economy and foster new development. Sufficient domestic resources will be difficult to obtain in the short and medium term since the country's revenue base, the oil industry, and the manufacturing and agricultural sectors have been seriously crippled. Moreover, the extensive damage inflicted on the country's infrastructure has placed serious constraints on the country's export capacity.

619. Almost since the onset of the war, the Government has gone to great lengths to maintain records of direct and indirect damage caused to the economic sector. Part of these records have been tabulated and summarized in a number of official publications. In addition they are supplemented by a considerable number of photograph albums of damaged sites and installations. The volume of these records, together with the large geographical area affected by the conflict, would make a detailed verification of damage and an assessment of reconstruction needs a time-consuming endeavour.

620. The mission was impressed by the reconstruction efforts thus far undertaken. However, while the country has done much to restore part of its production capacities and communication networks, only a relatively small proportion of the damage has been redressed to date.

621. The Islamic Republic of Iran has good professional/technical capacity and experience to deal with most of the reconstruction needs and it has committed a good portion of its national budget to this purpose. None the less, it will require access to financing resources, foreign equipment and technology from the international community in order fully to reconstruct and rehabilitate the country within a reasonable period of time.

622. As has been pointed out, this was a reconnaissance mission to ascertain the general nature and extent of damage sustained by the country's infrastructure as a result of the conflict and the reconstruction needs arising therefrom.

Appendix A

MEETINGS WITH IRANIAN AUTHORITIES

During the course of its visit to the Islamic Republic of Iran, the United Nations team met with senior representatives of government ministries and departments closely involved in the reconstruction process. The team was provided with background information on the damage sustained by each sector during the war and on the steps taken or contemplated for its repair and/or reconstruction. These meetings are set out in the order in which they took place.

1.	Mr. Ali Khorram	- Adviser to the Foreign Minister and Head, Persian Gulf Headquarters
2.	Mr. Mehdi Navab	- Deputy Minister of Economics and Finance, Ministry of Economics and Finance
3.	Mr. Masoud Roghani Zanjani	- Vice President and Head, Plan and Budget Organization
4.	Mr. Mosoud Nili	- Deputy Director, Plan and Budget Organization
5.	Mr. Mohsen Yahyavi	- Deputy Minister, Director of Corporate Planning and Board Member of National Iranian Oil Company, Ministry of Oil
6.	Mr. Abbas Akhondi	- Deputy Minister of Housing and Urban Development and Director, the Housing Foundation
7.	Mr. Mohammad Mallaki	- Deputy Minister for Electricity, Ministry of Energy
8.	Mr. Majid Pasha	- Deputy for Water, Ministry of Energy
9.	Mr. Hamid Mirzadeh	- Vice President for Executive Affairs
10.	Mr. Mehdi Hojjat	- Director, Cultural Heritage Organization, Ministry of Higher Education
11.	Mr. Hossein Shahaboudin	- Deputy Minister, Ministry of Post, Telephone and Telegraph (PTT)
12.	Dr. Djalal Rasoolof	- Deputy Minister of Agriculture, Ministry of Agriculture

13.	Mr. Hassan Dehgan	- Deputy Minister for Development Affairs, Ministry of Transport
14.	Mr. Mehdi Tabeshian	- Vice President, Islamic Republic of Iran Broadcasting (IRIB)
15.	Mr. Jalil Habibollahian	- Deputy Minister of Education, Ministry of Education
16.	Dr. Parviz Vazirian	- Director-General of Family Health, Ministry of Health and Medical Education
17.	Mr. Mohamad Saif	- Deputy Governor General, Khuzestan Province
18.	Mr. Yahya Mohammad Zadeh	- Governor General, Ilam Province
19.	Mr. Ali Nekoui Zahraee	- Governor General, Bakhtaran Province
20.	Brigadier Hussain Allaei	- Deputy Minister, Ministry of Defence
21.	Mr. Karam Ali Ahmadi	- Deputy Minister, Ministry of Labour and Social Affairs and Head, Foundation for Displaced People
22.	Mr. Mohsen Rafighdoust	- President, the Foundation for the Disabled
23.	Mr. Rasoul Zargarpour	- Deputy Minister for Development, Ministry of the Interior
24.	Dr. Ali Akbar Velayati	- Minister of Foreign Affairs

Appendix B

OFFICIAL DOCUMENTATION SUBMITTED TO THE MISSION

The following list shows the documents officially submitted by the Iranian authorities to the mission:

1. Final report on the estimate of the economic damages of the imposed war, Plan and Budget Organization (Text in Farsi only, tables translated).

2. Policies, priorities, functions and experiences of nine years of reconstruction (paper presented by Mr. Hamid Mirzadeh, Vice-President in Administrative Affairs, Special Representative of the Government in Reconstruction and Renovation in War-Damaged Areas to the International Conference on the Reconstruction of the War-Damaged Areas, University of Tehran, 6-16 March 1986).

3. Summarized version of the first five-year economic, social and cultural development plan of the Islamic Republic of Iran (1989-1993), Plan and Budget Organization.

4. Reconstruction of war-damaged areas in the Islamic Republic of Iran in peace-time, Vice-President for Executive Affairs.

5. Map showing the Iraqi attacks against residential quarters in the Islamic Republic of Iran until 22 July 1985, Vice-President for Executive Affairs.

6. Population by province, delivered by Housing Foundation (source: Plan and Budget Organization).

7. Proceedings of the International Conference on the Reconstruction of the War-Damaged Areas.

8. Summary report on war-damaged areas, Ministry of Agriculture.

9. Situation in the provinces of Khuzestan, Bakhtaran and Ilam, Ministry of Agriculture.

10. Information regarding Abadan refinery and damages occurred due to the war.

11. Capacity figures, actual feeds and refined products for NIOC refineries 1979-1991, National Iranian Oil Company (NIOC).

12. Data on off-shore platform attacks, NIOC.

13. The damaged and destroyed area report, Telecommunications Company of Iran, June 1991.

14. Estimation of damages caused to high power transmission stations, Islamic Republic of Iran Broadcasting.

15. Outline of implications of the imposed war on the Islamic Republic of Iran Broadcast services, including maps, Islamic Republic of Iran Broadcasting.

16. Preliminary estimation of the imposed war damages in the postal network of the Islamic Republic of Iran; pictures of damaged post office in Khorramshahr; blue prints (8) of typical post office buildings in different villages.

17. Outline on the present and future Iranian telecommunication network, Telecommunication Company of Iran.

18. Ministry of Roads and Transport Organization chart.

19. (a) Airport plans

    (i) Hamadan

    (ii) Sanandaj

    (iii) Tabriz (2)

    (iv) Urmiyeh (2)

    (v) Abadan (6)

    (vi) Bakhtaran

    (vii) Shiraz (3)

    (viii) Ahwaz

    (b) Excerpts from Iranian Aeronautical Information Publication

    (c) Report on damage to meteorological stations (Farsi)

    (d) List of civilian aircraft damage

20. (a) Road damage maps

    (i) Khuzestan

    (ii) Ilam

    (b) Road damage diagrams

    (i) Ilam

    (ii) Bakhtaran

(c) Bridge damage locations

(i) Ilam

(ii) Bakhtaran

(d) Equipment loss

(i) W. Azerbayjan

(ii) Lorestan

(iii) Khuzestan

(iv) Karbala

(v) Ilam

(vi) Esfahan

(e) List of bridges damaged

(i) Ilam

(ii) Khuzestan

(f) Typical road cross-sectional drawings

21. (a) Report on damage in rail sector

(b) Rail statistics 1980-1990

(c) Station plans

(i) Hattappe

(ii) Hamidi

(iii) Hosseinieh

(iv) Karun

(v) Andimeshk

(vi) Bandar Immam

(vii) Khorramshahr

(viii) Ahwaz

(d) Rail bridge plans

(i) Maconnerie

(ii) Tolezang

(iii) Ahwaz

(iv) Meyanh

(v) Lachgar

(vi) Kotoor

22. (a) Report on damage at Khorramshahr

(b) Volume of dredging required

(c) Plans of

(i) Khorramshahr)
) English
(ii) Emam Khomeyni)

(iii) Abadan - Farsi

(d) Ports and Shipping Organization map showing all ports

(e) List of ships damaged

(f) List of ships sunk or immobilized in Shatt al-Arab

23. Two route maps of new points of microwave network, 1984.

24. Khuzestan regional telecommunication network.

25. Population statistics of war-stricken provinces and cities, Plan and Budget Organization.

26. The role of the Housing Foundation of the Islamic Revolution in reconstruction of the war-damaged areas: case of reconstruction Toungeh 1, 2 and 3 on Abadan Island, Khuzestan Province.

27. A new thought on regional planning for reconstruction of war-damaged areas: the case of regional planning and design of Abadan Island.

28. Booklet entitled "Our tyrannized cities, statistical survey of aggressions of Baathist regime of Iraq against Iranian cities and residential areas".

29. Introduction pamphlet on "Electric Power Industry in Iran", published by Power Division Power Planning Bureau, June 1991.

30. Damage reports of the four attacks at the hydroelectric dam, Abbas-Pour Dam (Farsi only).

31. Ramin thermal power station - Ahwaz, Ministry of Energy.

32. Summary of damages caused by bombardments to Dez Dam power, Ministry of Energy.

33. Sites visited in Khuzestan, Ministry of Energy.

34. National and provincial grid diagrams, Ministry of Energy (Farsi only).

35. 1989 company report on electric power, Ministry of Energy.

36. 1984 company report on electric power, Ministry of Energy.

37. Information regarding Razi Chemical Complex submitted by the manager of the company.

38. List of industrial and productive units that sustained damage, Khuzestan province, Ministry of Small and Light Industries.

39. Assessment of damages to and the reconstruction of the industrial and mining sector of the Islamic Republic of Iran - results of field visits.

40. Map and table from the Cultural Heritage Organization listing damage to historic monuments and sites during 1980-1988.

41. List of the historical monuments that have been destroyed in Esfahan.

42. A brief report on damages to the education sector, Ministry of Education.

43. Map showing destroyed educational buildings in war-stricken and bombarded provinces, by the Organization for the Renovation, Development and Equipment of National Schools, Ministry of Education.

44. Plan of action on rebuilding for children - rehabilitation and expansion of PHC network in war-affected areas, UNICEF.

45. Health facilities destroyed in West Azarbayjan, Kordestan, Ilam, Bakhtaran and Khuzestan provinces.

46. The Imposed War, vols. 1-5.